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TUBERCULOUS LESIONS IN THE CHEST IN CHILDHOOD

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The incidence of tuberculous infection usually increases with the age of children, and, as one might expect, with the greater incidence there comes more tuberculous lesions, but from infancy to childhood the scene changes a great deal. A glance at the mortality curves shows that the number of deaths from tuberculosis during the period of childhood is relatively small. Perhaps there are several reasons why this is true. During infancy when there is exposure it is usually with some close associate who fondles and kisses the infant, thus day after day transmitting tubercle bacilli to its body. As the period of childhood approaches and continues, casual exposure becomes more frequent. The child who meets occasionally with a tuberculous patient receives his infection, but the exposure is not continued. One must also take into consideration that from those homes where there are open cases a fair percentage of the children die in infancy; thus leaving a smaller number for such termination during the period of childhood. Krause has called attention to the fact that during the first two years of life the lymph nodes are not functioning very efficiently, to filter out foreign material, including pathogenic organisms, thus bacilli carried to them may not be retained and may reach the blood stream in fair sized numbers. If the infant is already allergic from its infection, whenever the tubercle bacilli find lodgment, whether it be in the lung parenchyma or in the meninges of the brain or spinal cord, it is on allergic soil. Acute inflammation results and, if the allergy is high, even necrosis is not uncommon. But, when the period of childhood arrives the lymph nodes have becomes more compact in structure and serve more efficiently than they have before or ever will again. Thus tubercle bacilli carried to them are retained unless they are present in such large numbers, or allergy is so high that they destroy the lymph nodes themselves. Thus during the period of childhood we see lymph node tuberculosis as the prevailing type of lesion, and of all parts of the body the lymph nodes draining the lungs, such as those in the region of the hilum and tracheobronchial regions are most frequently involved.

Perhaps another reason that the number of deaths during childhood from tuberculosis is relatively low is that allergic reactions are often rather slight. In the childhood group we have children who have developed their tuberculous infection, with a high state of allergy in infancy or some subsequent time, who have overcome the bacilli to a certain extent and the allergy has had opportunity to wane. Again, we probably have a good many very mild reactions from casual contact, and here we must not overlook the possibilities of infections from the bovine bacillus which ordinarily is not highly virulent in the human body. Perhaps these mild infections do not result in that marked allergic state so dangerous to the child that we get from extensive and prolonged contact to the human bacilli with their high virulence.

The most common form of tuberculosis seen during this age period is the childhood type. In the examination of a large number of children one sees childhood tuberculosis in most all its phases of development and retrogression from acute inflammatory pneumonic processes in the lung with definitely enlarged hilum shadows on the same side (Fig. 1) to the very sharply outlined and discrete Ghon's tubercle, which is well ossified,

regions of the hilum and tracheobronchial lymph nodes. It is a well known fact that enlargements of these lymph nodes may be and frequently are, due to other causes than tuberculosis, just as temporary enlargements of the cervical lymph nodes are more frequently due to other causes than tuberculosis. However, McPhedran has shown that lymph nodes of the tracheobronchial group free from the calcium, even though they are enlarged, cast no shadows that will differentiate them from the shadows of the main stem and larger branches of the air and blood bearing trees. Many x-rays made during and immediately after acute and serious infections in children showed no evidence of lymph nodes of the tracheobronchial group. This is an outstanding contribution since we had formerly believed that many of the acute infections produce enlargement of the lymph nodes that cast distinct shadows on the x-ray film. The only enlargements without calcium which are detectable by the x-ray film ,and this includes areas of caseations, are those which are large enough to bulge into the lung field. It has been pointed out that in anteroposterior films showing small and oval mediastinal bulges, the cause often is distortion of the patient's position, and in such cases the shadow of the sternum will be seen to the right or left of the spinal shadow. Therefore, in the past rotation has produced shadows which have been mistaken for mediastinal enlargements. Moreover, in children under the age of four years, because of their inability to cooperate, the films have often been exposed during expiration. They have also been taken during systole and under these conditions the mediastinum appears broad. In the earlier x-ray studies of the chests of children a very common diagnostic error was made by labeling all increased densities in the region of the lung hilum as areas of calcification. McPhedran has shown that round shadows may be cast by a vascular trunk directed towards the target so that the primary ray is approximately axial, or that semioval shadows are often recorded when the plane of the curve of a vascular trunk is directed slightly above or below the axis of the ray. He showed that slight rotation of the patient about his perpendicular axis is of great value in deciding whether increased densities in the hilum are due to calcium deposits. McPhedran rotates the patient so that the cardiac border coincides in the film with the right border of the spine. An exposure made in this position has enabled him to identify nearly all densities on both sides of the border of the spine. This position is also helpful in detecting intrapulmonary lesions which may not be sufficiently clear on posteroanterior films. Another position of great value is the oblique position described by Pritchard and McPhedran. This may reveal pulmonary lesions otherwise not detected and also calcium deposits at the carina. Such deposits, as much as an inch in diameter, may escape detection in antero-posterior films. In contour calcium deposits may be oval, rounded, irregularly nodular, pear-shaped, etc., but must persist when films are taken at various angles. When great care is exercised one may determine with a fairly high degree of accuracy the presence or absence of calcium deposits in the region of the lung hilum and the tracheobronchial lymph nodes. Once deposited it is believed that calcium is not reabsorbed, and the longer it exists the more likely is the disease to become walled off. Therefore, it is of great importance to study by x-ray calcium deposits in the hilum and tracheobronchial lymph nodes. It is not always necessary to find a lung lesion either in the form of an acute inflammation or a Ghon tubercle. When enlargements or calcification or both are present in the hilum or tracheobronchial lymph nodes (Fig. 3), the lesion in the lung may be in some obscure place so that it is not seen on the x-ray film, or it may have healed by resolution and completely disappeared. Again there may be no lesion in the lung. Krause has shown that when tuberculous processes exist in parts of the body quite remote from the lung the disease is

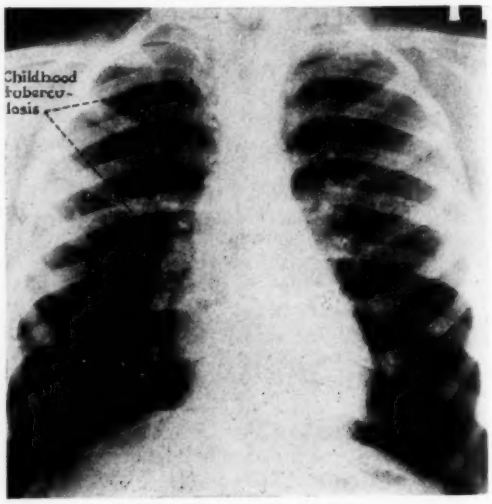

Fig. 3 R. B. Age 8 years. Made from roentgenogram taken on May 2, 1922. Childhood tuberculosis manifested by primary focus in the left lower lobe and calcification of the hilum and tracheobronchial nodes on the right side. Father has tuberculosis. Mother said to have bronchitis. Von Pirquet test strongly positive.

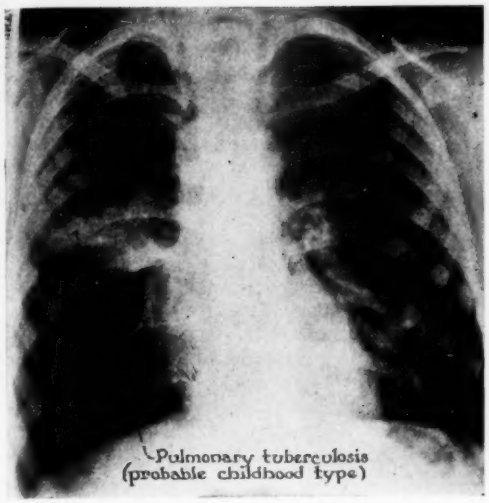

Fig. 1A. M. X. Age 8 years. Made from roengenogram taken on December 12, 1924. Definite parenchymal infiltration extending from hilum to the lateral chest wall in the region of the second interspace on the right side. Mother suffering from tuberculosis. Father died of laryngitis.

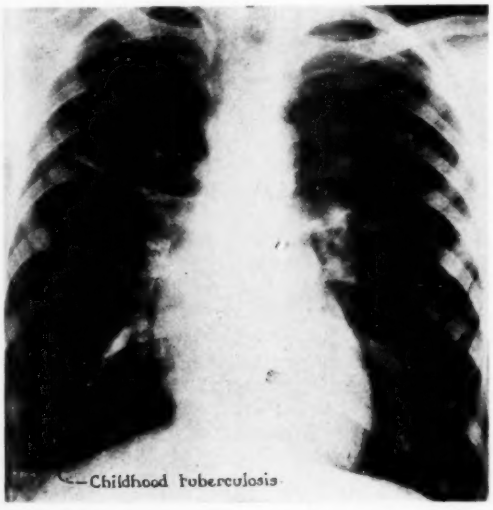

Fig. 1B M. X. From chest of same child as Fig. 1A. Made from roentgenogram taken on February 26, 1929. Thickening interlobar suptum between right middle and upper lobes with some fibrosis above it. Enlargement and calcification in the right hilum.

with the hilum and tracheobronchial lymph nodes well calcified on the same side (Fig. 2). In cases where the Ghon tubercle is well developed and calcification is definitely present in the region of the hilum we have no way of determining, with high degree of accuracy just when the progressive lesions ap-

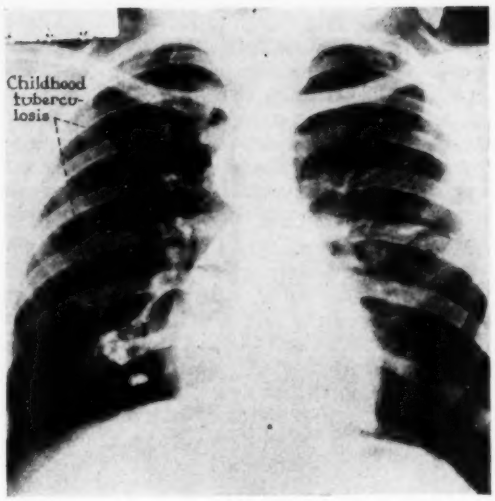

Fig. 2. E. J. Age 13 years. Made from roentgenogram taken on April 1, 1926. Large primary foci right lobe. Calcification in right hilum. Films made on March 24, 1922 showed the same condition. Father died of pulmonary tuberculosis. Mother said to have bronchitis and asthma.

peared. They may have been present in early infancy or at any subsequent time up to a few months before the examination. Indeed, calcium deposits have been found in lymph nodes in the bodies of infants as young as five months. Therefore, our former belief that a process which contains calcium is one of long standing is not necessarily true in every case. The childhood type of tuberculosis in boys and girls between the ages of two and twelve years requires special discussion as to diagnosis, treatment, prognosis and prevention.

In diagnosis much depends upon the history of exposure, although if this is not obtained one can not rule out tuberculosis. There are so many undiagnosed cases of adult tuberculosis in homes daily exposing children that a negative history of exposure is not very significant. The physical examination is of little avail. The Eustace Smith and D'Espine's signs give us little and, in most cases, no information of importance. Interscapular dullness of percussion is the source of very slight or no information and is often misleading. The physician who clings to these signs today may be likened to the man who drives an ox-cart in automobile and airplane days. Examinations on a good many thousand children in different parts of America have shown that the two most important findings in the diagnosis of childhood tuberculosis are: First, a positive cutaneous tuberculin test, and, second: x-ray changes in the lung parenchyma or in the

reflected fairly early in the region of the lung hilum. In other words, tubercle bacilli are carried to the lung hilum where they produce enlargements of the hilum nodes. Again we must not overlook the fact that the lesion may be primary in the hilum and tracheobronchial nodes; that bacilli reaching the body through one of the portals of entry may not find lodgment until they reach these nodes where they produce primary lesions.

When symptoms are present in childhood they are of great importance. The first symptoms may be mistaken for those of influenza or even a bad cold. They may consist of loss of weight, loss of play-spirit, temperature elevation. One must never be misled by the absence of symptoms. All too frequently the child is taken to the physician, and because of no definite symptoms is told that tuberculosis does not exist. It has been demonstrated repeatedly and proved most conclusively that the child without a suggestion of symptoms may have a frank tuberculous process of a progressive nature.

Treatment should be instituted in the case of every boy and girl with the childhood type of tuberculosis. It is true that some will heal their disease completely, but we do not know who they are nor do we have any method of examination so refined as to help us determine with a high degree of certainly when healing is complete, with the possible exception of the cutaneous tuberculin test. Therefore, we must treat all.

The treatment necessary will depend considerably upon the stage of the disease when diagnosis is made. If there is a definite inflammatory process in the lung, with corresponding enlargement in the region of the hilum and tracheobronchial lymph nodes, most certainly strict bed rest should be recommended. We can not say that the disease would not heal spontaneously without any treatment, but experience has shown that it is safer to prescribe strict bed rest in such cases. If the disease is diagnosed after calcium or bone has been deposited in the primary lung focus, or the focus has healed by resolution and definite calcium deposits can be seen in the tracheobronchial or hilum nodes, strict bed rest is not necessary, but most certainly every case should be kept under very careful observation and an attempt made to build up or maintain an excellent general condition of the child's body.

Such children usually are able to carry on their school work, and if the physician is conscientious he will report all such cases of childhood tuberculosis to the health department. This in many places immediately excludes the child from school by state law. In order to meet this situation there is a strong tendency at present to provide special schools for tuberculous children where the communities are large enough to justify them, or special rooms in schools in smaller communities. To these schools and rooms the children from homes without sufficient funds to employ private physicians may be sent from charity clinics. Private physicians may send the children among their clientele to such schools and still keep them under observation. Thus the child is given an opportunity to continue his mental development at the same time as he continues the healing of his tuberculous process.

Lymanhurst School for Tuberculous Children, founded by Dr. F. E. Harrington has a capacity of approximately 160 and provides treatment for boys and girls, most of whom have definite evidence of the childhood type of tuberculosis. The schedule at Lymanhurst is approximately as follows:

The children live at their homes and come to the school at 8:30 each school day. At 8:50 they assemble for diet, which consists of cooked cereal, whole milk and sugar, with a caloric value of 100. They pass to their class-rooms, where they remain from 9 to 11. This is followed by a twenty-minute recess, during which time the playground is carefully supervised and suitable games are played. The period from 11:20 to 12:30 is spent in the class-room. At 12:30 the children pass to the dining-room, where dinner it served. This consists of easily digested foods with a value of 900 to 1,000 calories. Care is taken that vitamines and minerals are supplied in sufficient quantities. The rest period is from 1:30 to 2:30 p. m. During this period each child lies upon a comfortable bed, and most of the time is spent in sleep. At 2:30 class work is resumed and at 3:30 food, consisting of dry cereal, milk and sugar, valued at 100 calories, is served. The children are then permitted to go to their homes.

The second institution of this kind developed at Berkeley, California, is the result of the vision and hard work of Drs. W. P. Shepard and Chesley Bush and their associates. This school is proving to be a tremendous help in the tuberculosis program of Alameda County.

Other cities in the United States are contemplating the development of such schools for their boys and girls with the childhood type of tuberculosis. These schools not only provide for the conservation and regulation of energy expenditure, close medical and nursing supervision, diet, etc., but they provide for the health education of the girls and boys enrolled, as well as many parents, guardians and organizations interested in their welfare. It is hoped that this education will protect them in later life against diet fads,

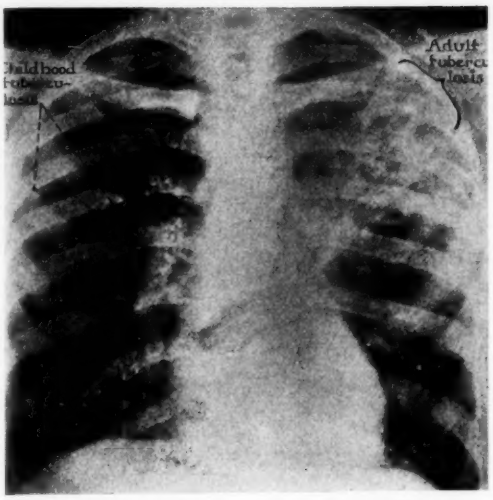

Fig. 4. W. B. Age 21 years. Made from roentgenogram of the chest taken on June 8, 1929. Childhood tuberculosis (Ghon tubercle right third interspace near periphery. Numerous calcifications, right hilum). Adult type tuberculosis involving upper lobe of left lung. No history of exposure.

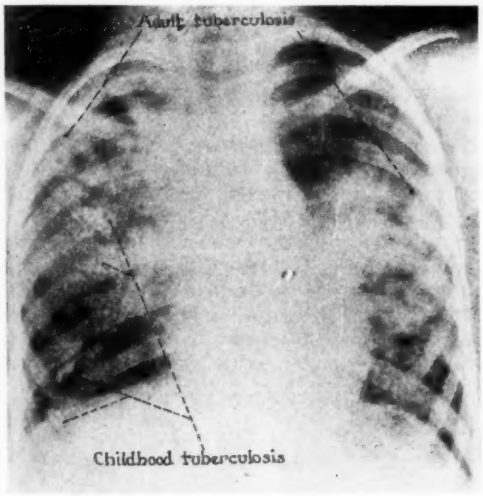

Fig. 6C. W. G. Age 7 years. Made from roentgenogram taken on December 6. 1928. Pulmonary involvement left first and second interspaces with definite enlargement of the hilum. Probable childhood type of tuberculosis. The family was advised to have this son examined after the father's disease was detected although he is apparently in excellent health.

heliotherapy fads, and other fads so destructive to the well-being of young men and young women.

The prognosis in cases of childhood tuberculosis at this age period was formerly thought to be excellent, when evidence of calcification could be seen on the x-ray film and when the child appeared to be in good health. For the time being it is good in most cases, but there are enough exceptions to make us extremely conservative when discussing the future of a child with such definite findings, even though they be calcified. If the intimate exposure to tubercle bacilli is continued the highly fatal adult type of pulmonary tuberculosis may result (Figs. 4 and 5). Again, although calcification may be extensive we have no method of determining when the entire lesion is calcified and walled off. In other words, there may be adjacent to the calcium deposits, areas of caseation which are potential menaces as long as they persist. From the Lymanhurst School we have discharged children whom we believed to have their disease well healed, but who soon after died of acute tuberculosis. Therefore, he who renders a good prognosis to all cases with calcification in the hilum does not have all the facts in hand, nor as good an understanding of the subject as is possible. It has been shown that even the immediate prognosis may not be good, for the rupture of a lymph node may distribute the caseous material to other parts where, if it falls upon allergic soil, it will produce acute inflammation and even fatal disease. But what about the more remote prognosis? Here we have been inclined to believe that it was also good, but Rathbun, Opie and others dampened our enthusiasm by showing that it is the case with childhood tuberculosis who develops the adult type. At the postmortem table Opie has found that the adult type of tuberculosis never develops in the absence of the childhood type of infection. Rathbun has shown that among boys and girls of high school age who develop the adult and killing type of tuberculosis it is possible to demonstrate on the x-ray film old childhood lesions with calcification in fifty per cent of the cases. From his experience, which is large, and his judgment, which is excellent, he believed that the three or four per cent of boys and girls who have childhood type of tuberculosis furnish seventy-five per cent of the teen age boys and girls who develop the fatal adult type of disease. Our experience with tuberculosis in the teen ages is very similar to that of Rathbun.

Perhaps the best method of prevention of tuberculosis in childhood is through careful study of the epidemiology of the disease. In any community it is possible through two procedures to determine with a fairly high degree of certainty the number of children who have been infected, and from those the number who have developed the childhood type of disease. These procedures consist first of tuberculin testing all children of a community, preferably by the intracutaneous

methods. When this has been done properly one has detected most of the children who have been infected with tubercle bacilli. The number will vary with conditions in the community, such as economic status of the people, modes of living and, most of all, the incidence of the adult type of tuberculosis in that community. Ten per cent may react, as Slater has found in a rural community, or seventy-two per cent may react, as Hetherington has found in a great city.

The second procedure of x-raying all children who react positively. By no means will every reaction show evidence of childhood tuberculosis. In fact the majority of children with positive tuberculin tests do not show the characteristic findings of childhood tuberculosis. Perhaps when tubercle bacilli found lodgment in the tissues of their bodies a small tubercle was formed, and the bacilli became so walled off that nothing further is heard or seen of them except that a hypersensitiveness to tuberculin is observed. Again one must keep in mind that our present methods of making examinations by the x-ray are quite crude, and that slight disease in the region of the hilum may remain undetected. But it is the frank childhood type of tuberculosis that we are seeking to detect by the x-ray examination. Where these procedures have been carried out it has been shown that approximately three to four per cent of the entire childhood population shows evidence of chlidhood tuberculosis. By these two procedures we have rounded up, so to speak, three groups; those who react negatively to tuberculin; those who react positively and who have been definitely infected, and those who react positively and also have x-ray evidence of the childhood type of disease.

From this point our preventive work is carried on to the second and third groups of children. When a child reacts positively to tuberculin, in all probability that child has come in contact directly or indirectly with some person or animal suffering from tuberculosis or acting as a carrier. The contact may have been most indirect and casual, as in case tubercle bacilli are borne to the child's body on fruits and other foods from persons located many miles, perhaps hundreds, from the child. In other words, tubercle bacilli have reached the body of the child and have gained lodgment; they are producing or have produced tubercle. So our next step, the x-ray examination, may tell us something of whether the exposure has been intimate and prolonged. We feel that mos tchildren who have developed frank childhood tuberculosis, whether it be in a recent state of development or apparently well calcified, have had intimate and prolonged contact exposure.

Therefore, when these cases have been found, we should make a desperate effort to locate the source of the exposure. We must look to their close associates. Here the private physician can do much for he often knows the families better than any other health worker. When he has a case of tuberculosis in the home, such as a father or mother, he is not discharging his full duty to the family when he treats that patient alone. It is his duty to apply the cutaneous tuberculin test to every member of the family and to as many of the other contacts as possible. He should next x-ray the chests of those who react positively (Figs. 6 A, B and C).

The physician in private practice who finds evidence of childhood tuberculosis in the body of a child has not discharged his full duty to the child, the family, or the community until he has made a careful search among all the close associates of the child for the source of the tubercle bacilli. The children who manifest no evidence except positive tuberculin tests should have x-ray examinations every six months and preferably every three months as long as the health appears good, and oftener if symptoms appear. For such repeated x-ray examinations, a single film of the chest usually will suffice. This reduces the expense of the examination considerably. The treatment of the cases with childhood tuberculosis above described is also a preventive measure, because it has been shown that it prevents, to a certain extent, the adult and killing type of tuberculosis in later life.

Children with no contact exposure should have frequent periodic examinations. These examinations should include the cutaneous tuberculin test for all who have previously reacted negatively, and x-ray films for all who have previously reacted positively. A study of the allergic reaction may also be helpful in prevention. If it becomes markedly positive it is a fair indication that the child needs treatment to prevent the development of extensive disease, and even an attempt at desensitization with extremely minute doses of tuberculin has been suggested.

The adult type of pulmonary tuberculosis occurs during the period of childhood but it is not common.

Tuberculous pleurisy has been reported rather commonly in children after the fifth year of life; however, with x-ray studies, it has been found to exist frequently in earlier years than we formerly believed. Frequently pleurisy with effusion not accompanied or preceded by acute respiratory infection appears in children who have been in perfect health. It is secondary to lesions somewhere

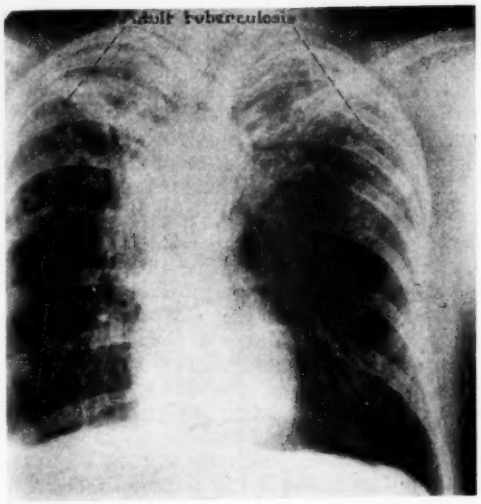

Fig. 6A. M. G. Age 52 years. Made from roentgenogram of the chest taken on December 11, 1928. Extensive pulmonary tuberculosis throughout the greater part of the right and the upper half of the left lung. Symptoms date from March, 1925. Tubercle bacilli in the sputum. Lesions in chests of two sons are illustrated in 6B and 6C.

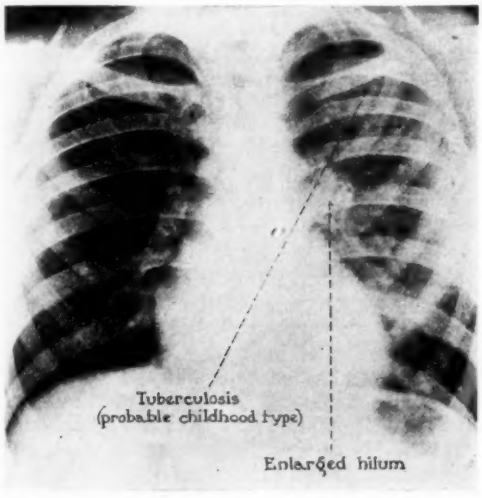

Fig. 6B. S. G. Age 13 years. Made from roentgenogram taken on December 6, 1928. Pulmonary involvement in the left first and second interspaces with definite enargement of the hilum on the left side. Probably childhood type of tuberculosis. The family was advised to have this son examined after the father's disease was detected, although he apparently is in excellent health. Von Pirquet positive.

in the body, and is rather frequently associated with tuberculous peritonitis. It occurs in children who are extremely allergic, and therefore is regarded as an allergic reaction. At the onset there may be excruciating pain over the involved side. After the effusion

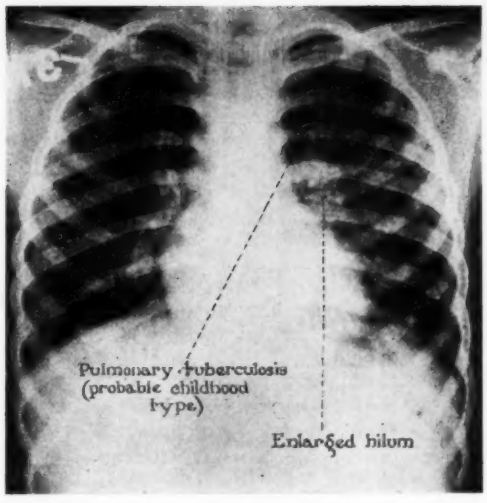

Fig. 5 C. E. Age 9 years. Made from roentgenogram taken June 1, 1926. Childhood tuberculosis (Ghon tubercles right base and calcifications in right hilum). Adult type tuberculosis involving the greater part of the right and the central portion of the left lung. Exposure to tuberculosis through father. Von Pirquet negative. Died soon after this examination.

forms the pain disappears. In other cases there is no pain. Often there is considerable temperature elevation for a few days. Frequently the symptoms are of short duration; hence the numerous failures to diagnose the condition. In fact, a physician is not consulted in many such cases. If seen while pain is present one may elicit friction rubs over the involved side. When the pain has disappeared the signs of fluid in the pleural cavity are usually elicited. The x-ray is of great value in diagnosing such cases. The fluoroscopic examination usually shows obliteration of the costophrenic angle and lagging or immobilization of the diaphrogm on the side of the disease. One may be able to see a fluid line. X-ray films should be made in every case not only to confirm the diagnosis but also to aid in the search for tuberculous involvement in the lung parenchyma. The cutaneous tuberculin test is nearly always markedly positive. The removal of a small amount of fluid to be centrifuged and studied under the microscope and for animal inoculation should be a routine practice. The treatment consists of reducing movement of the affected side with adhesive tape, etc., and liberal use of sedatives while pain is present. Strict bed rest should be employed in every case and continued over three months or longer. One must never forget that a tuberculous pleurisy is frequently accompanied by parenchymal lesions subpleurally located which may escape detection even by

the x-ray. Therefore the patient should be treated as one with pulmonary tuberculosis. If marked symptoms such as temperature elevation, rapid pulse, etc., exist, the removal of a part of the fluid and the introduction of enough oxygen or filtered air to bring about an atmospheric pressure in the pleural cavity may hasten the process. Once this is begun the pneumothorax should be continued over a considerable period of time. The effusion, if not present in too large amounts, in all probability is nature's method of separating the visceral from the parietal pleura, thus relieving the patient of pain and bringing about partial compression of the lung. In other words, it is an attempt to immobilize the parts involved. Therefore, the fluid should not be removed unless pneumothorax is begun or it is present in such large quantities as to cause pressure symptoms. The prognosis in such cases is usually very good. Even without treatment many get well, but a fair percentage will later report with parenchymal tuberculosis.

Tuberculous pericarditis often accompanies pleurisy and peritonitis. Through the lymphatic channels the pericardial cavity communicates very freely with the peritoneal and pleural cavities. On the other hand, tuberculous pericarditis may exist in children independent of pleurisy and peritonitis. In such cases one finds disease in the mediastinal lymph nodes or in some other part of the body. The disease usually is secondary although some authors have reported it as a primary process. Morris and Little have made a careful study of the physical findings in pericarditis and find that the cardiohepatic angle in pericardial effusion is usually an acute angle. The area of relative cardiac dullness is pyriform and generally extends upward to the first interspace. Widening of the area of dulness and of the x-ray shadows is best determined with the patient in the recumbent posture. They have found the most reliable sign of fluid in the pericardium is shifting of dulness when the patient is changed from the recumbent to the erect posture. They have also observed a marked decrease of visible pulsations in the shadow on fluoroscopic examination. In such cases one may also elicit signs of compression of the left lung posteriorly. These include bronchial breathing, bronchophony or egophony. The signs are particularly noticeable at the angle of the left scapula in children. The cutaneous tuberculin test as in cases of pleurisy is of great value. The removal of pericardial effusion for direct smear studies and animal inoculation is also of great value in confirming the diagnosis. The treatment consists of strict bed rest with comfortable atmospheric conditions, good foods and close medical observation. Aspiration alone apparently is not of much avail. Pneumopericardium has been employed with good results by some workers. Pericardotomy which brings about an interior drainage into the spaces surrounding the pericardium has been practiced. Recently Lemaire has used lipiodol in the treatment of tuberculous pericarditis. The prognosis is only reasonably good.

Tuberculosis of the myocardium may occur in the form of large tubercles or tuberculous infiltration or miliary tubercles. In a group of 71 cases approximately forty per cent were less than fifteen years old. The symptoms and findings are palpitation, diffuse pulsation, rapid heart action, feeble heart sounds, dsypnea, cyanosis, unconsciousness, general edema and sudden death. Usually the disease is associated with tuberculosis of the bronchial lymph nodes and the lungs. Tuberculous endocarditis also occurs in childhood. In such cases there is usually no history of tonsillitis, chorea, rheumatism or scarlet fever, but a tuberculous process is often found in some other part of the body.

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THE PREVENTION OF TUBERCULOSIS

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Prescott, Arizona

(Presented by request before the Health Officers' section of the Second Annual Meeting of the Arizona Public Health Association, at Prescott, April 17, 1929.)

After many centuries of persistent intensive study by hundreds, yes, thousands, of quiet unobtrusive investigators in every part of the known world, the brilliant discoveries of Pasteur laid the foundation for the scientific study of bacterial diseases. In 1882, Robert Koch discovered the tubercle bacillus and proved conclusively that it—and it alone—is the causative factor in producing all forms of tuberculosis.

After the discovery of the tubercle bacillus, the question of the prevention of tuberculosis seemed to have become an extremely simple one. This disease, whose ravages among the inhabitants of civilized countries had become so extensive that it was referred to as the "Captain of the Men of Death"—this dread disease is caused by a tiny microscopic germ. Ergo, all that is necessary to prevent the disease is to destroy the germ. Beautifully simple, isn't it? And so it seemed, even to students of this disease, for a number of years.

Further study, however, disclosed the fact

that there is another very important consideration in the production of the disease tuberculosis. This is the reaction or response of the tissues of the body to invasion or infection by the tubercle bacillus. Extensive postmortem findings have proven conclusively that over ninety per cent of all adults residing in civilized countries have been infected with the tubercle bacillus.

In only comparatively recent years, however, have pathological findings and clinical observation shown that there is a vast difference between the effects of a primary, or first, infection and a secondary or re-infection. The difference in the effects of these two forms of infection is due, not to any change in the virulence of the tubercle bacillus, but to an altered reaction on the part of the body tissues. The first, or primary, infection, if it has not been so severe as to cause progressive and fatal disease, confers on the tissues of the infected body a degree of immunity which changes greatly the effect of subsequent infections. These are fundamental facts which must be kept constantly in mind if we are to use rational methods in the prevention of this disease.

Having determined that the tubercle bacillus is the causative factor in tuberculosis, we naturally ask ourselves how this germ enters the body. In the vast majority of cases the germ enters the body in one of two ways: either by inhalation or by ingestion. In other words, the germ enters either by the nose or by the mouth. It is either breathed in or swallowed. Have we any method of determining which of these two methods is the more likely or the more common? We have such a method of determination so far as the first, or primary, infection is concerned.

Mention was made a few minutes ago of the fact that a first, or primary, infection confers a degree of immunity on the tissues of the host. To this immunity or altered reaction of the tissues of the host, the name allergy is given, and advantage is taken of this allergic reaction to determine whether or not a child has been infected by the tubercle bacillus. Practically, this test is usually performed by injecting tuberculin into the skin after the method of Pirquet. For the benefit of those who are not physicians, it may be stated that a positive Pirquet skin reaction does not prove that the individual has the disease tuberculosis. All it proves is that the individual has been infected with the tubercle bacillus. He may be in perfect health, but he has had his childhood infection with the tubercle bacillus.

Many thousands of tuberculin skin tests in many of the larger cities of the world have disclosed some very interesting facts. The first human infection—that is, the first, or primary, infection in the human race—takes place as follows:

(a) During the first two years approximately ten per cent of all children in civilized countries become infected with the tubercle bacillus.

(b) At three years fifteen per cent to twenty per cent are infected.

(c) At five years fifty per cent are infected.

(d) At fifteen years seventy-five per cent are infected.

(e) At maturity over ninety per cent are infected.

An analysis of these percentages shows that before adolescence seventy-five per cent of human beings become infected for the first time. Of these, a full half or more are infected during the three years between three and six years of age. In the first three years, only one-quarter of this seventy-five per cent become infected: and in the nine years between six and fifteen years of age only one-quarter become infected.

What probable conclusions may be drawn from these analyses?

(a) Cow's milk is consumed more largely under two years than between three and six. The probabilities are that the greatest number of infections from cow's milk take place under two years of age.

(b) The greatest number of infections take place between three and ten years of age. "These are the years after locomotion has been perfected and the child's range of activity and association has been enormously widened. The average child spends more time out of doors than at any other period of his life. His habits, games, etc., keep him close to the ground. He accumulates on his hands the raw human sputum of the highways, sidewalks and floors of dwellings. The hands go to the child's mouth and so initiate tuberculous infection. The probabilities are that the greatest number of infections between three and ten years of age take place from raw sputum on the hands, which has been accumulated from highways, sidewalks and the floors of dwellings."

(c) In addition to these two sources of infection—the ingestion of cow's milk and of raw sputum—the third chief source of infection is the inhalation of bacilli-laden dust or droplets. This is especially so in the case of infants in tuberculous surroundings.

To recapitulate: There are three chief sources from which come the tubercle bacilli which cause the first, or primary, infection in human beings. In the order of their apparent importance they are:

1. Raw sputum. This seems to be the chief source of infection between three and ten years of age, the time when more than one-half of all childhood infections take place.

2. The inhalation of bacilli-laden dust or droplets. This form of infection would seem, probably, to take place only where children are in association with those actively ill from tuberculosis. This form of infection takes place principally in infancy.

3. The ingestion of milk from tuberculous cows. This, too, takes place principally in infancy, but may occur in any part of childhood.

Now, to cinch this part of the argument while these facts are fresh in our minds. What measures are demanded to prevent or to minimize the first, or primary, infection in human beings? Naturally they are two: First, make a determined effort to destroy all **raw** sputum, whether or not it contains tubercle bacilli. We can never teach the tubercular not to spit carelessly, if we allow the non-tubercular to expectorate promiscuously. **All** raw sputum should be destroyed. Second, insist on clean and, where possible, pasteurized milk from tuberculin-tested cows.

Now, to speak for a moment on re-infection, or secondary infection in tuberculosis. As stated before, the first, or primary, infection undoubtedly confers a degree of immunity against secondary infections. How great a degree of immunity, it is impossible to determine. Very probably the degree of immunity varies in different individuals. It likely varies in the same individual, at different times. Just at present the consensus of opinion among authorities on tuberculosis seems to be that, ordinarily, childhood infection probably protects the individual from all but massive re-infection from without.

This being the case, we naturally ask ourselves, when an adult, who has been infected early in childhood, develops active tuberculosis, where does the re-infection come from? Activation of the disease certainly means re-infection. If this individual has not recently been exposed to massive infection from without, and many of them have not, where does he get his re-infection? Why, he simply re-infects himself. The live tubercle bacilli, which have lain dormant in his lungs since childhood, cut off from the healthy parts of the lungs by being imbedded in solid, firm, scar tissue,—these tubercle bacilli escape from their prison and re-infect healthy tissues of the body.

Finally, the question arises, what are the factors which cause this scar tissue to soften and weaken and allow these bacilli to escape into the lymphatic spaces or the blood stream? In a word, they are: under-feeding, over-crowding, over-work, dissipation, and concurrent disease.

Proper preventive measures naturally suggest themselves. Relieve under-feeding, prevent overcrowding, avoid over work and dissipation. Prolong convalescent care of acute debilitating disease. Such measures will do a great deal to prevent reinfection with the tubercle bacilli and the occurrence of tuberculosis in adult life.

A word in closing, regarding the results that such measures, as have been outlined, have accomplished in the prevention of tuberculosis in the past twenty-five or thirty years. This year the National Tuberculosis Association celebrates the twenty-fifth anniversary of its organization. To this Association and its subsidiary societies is due a large part of the credit for the very intensive campaign which has been waged against tuberculosis. During these twenty-five years a broad well-organized, intensive campaign has been made against tuberculosis, such as had not even been approached in combating any other disease or group of diseases. What have been the results? In 1900, the death rate for tuberculosis in the registration area of the United States was 195.2 per 100,000 of population. That means that approximately two persons out of every thousand died from tuberculosis in the course of the year. The disease was then the first of the Captains of Death: and this was true, not only in our country, but generally throughout the world. By 1910, the death rate from the disease in the identical registration area, had dropped to 164.7, or a decline of 15.6 per cent in the ten-year period. In 1920, ten years after, the rate in the same group of states was only 112 per 100,000 living. In the second decade, the rate fell 32 per cent, or a little more than twice as fast as in the first decade. By 1926, the figure had fallen to 84.5 per 100,000 in the same states, which is considerably less than half the figure for 1900. In other words, an intensive and extensive campaign has cut the death rate from tuberculosis to less than one-half in twenty-six years. Tuberculosis is no longer the "Captain of the Men of Death" in this country. It has been relegated to third place, being now surpassed both by acute respiratory diseases and by cardio-renal diseases.

Surely, this is a most gratifying result. What has been accomplished against tuberculosis by constant concerted effort can be done against other diseases also. Organizations such as this will continue to prove a most important element in the fight against disease. The prospect for the future success of public health worker in the United States is most encouraging.

HELIOTHERAPY IN THE TREATMENT OF EXTRAPULMONARY TUBERCULOSIS

F. C. GOODWIN M. D.,
El Paso, Texas.

Read before the New Mexico Medical Society, at its Forty-Seventh Annual Meeting, at Taos, New Mexico, June 12-14, 1929.

The treatment of disease with sunlight is as old as the sun itself, but it was not until 1903 that an institution was established devoting its facilities to the treatment of surgical tuberculosis alone. Dr. A. Rollier, while an assistant to Professor Kocher, saw the need for something more than surgery for the treatment of bone and joint disease. He perhaps visioned temporary benefits obtained with sunlight and thereupon sought a location where uninterrupted treatment could be carried on the entire year. This was in the nature of an experiment, but whether he knew the requirements for results or not, at least he leads all other men in the world today in the treatment of extrapulmonary tuberculosis. Unquestionably the rsults must be due to his thorough knowledge of orthopedic surgery and to ideal climatic conditions.

We are taught that for ideal sites for heliotherapy, altitude is required to avoid interference of smoke, dust and moisture, these being the absorbent of ultra-violet rays and particularly those of the short wave lengths. Sufficient sun is required to enable an uninterrupted exposure for the year round. Too many of us see a change for the better during the summer months when we are able to expose our patients, only to see them decline with the coming on of a severe winter, when it is impossible to secure the advantages of the sun's rays.

Just how heliotherapy is beneficial is a disputed question. In almost every paper read we see that pigmentation is an index to a predisposition to recovery; however, no explanation for this has been offered. We frequently read that heliotherapy is curative because it raises the resistance. Still another suggestion is that the energy of the rays on reaching the body surface becomes transformed into chemical energy which plays its part in tissue cells and in the blood. In every discussion ultraviolet rays are conceded to be curative.

After our own investigations, and since thoroughly reviewing the literature, I have come to the conclusion that we are positive that ultraviolet rays produce pigmentation and that is about all.

It would seem that perhaps we are attributing too much of our results in the treatment of surgical tuberculosis, to ultraviolet rays. The supposition that the skin is a ductless gland and acts as a gland of internal secretion and that pigmentation converts long ultraviolet rays into short ultraviolet rays is difficult for many of us to comprehend.

We know by experiment that ultraviolet rays cause pigmentation, that they are absorbed by the blood; but further than that, we do not know. Why not give the organism itself the credit and say that by exposure of the patient to the sunlight pigmentation is produced? Pigmentation is protective and enables the patient to be exposed for a longer length of time. This exposure brings about normal physiology and enables the organism to use its combating forces more efficiently to defeat the insults of disease to the tissues.

By exposure of the skin to the sunlight we are endeavoring to regain a primitive skin with all its functions. After proper exposure, the body blanket is able to adjust itself to air motion and temperature change without suffering to the organism.

Capillary circulation is so established and increased, perhaps by the heat rays, that every component of the skin is made active. The skin is changed from an atrophied excretory organ to one of high potency.

A patient exposed for three hours daily excretes four to five liters of fluids per day. This naturally brings with it end products of metabolism in the nature of urea, uric acid, creatinin, scatol, albumins and phenol. Were it not for a highly functioning skin, these products would remain in the tissues until carried away through the urinary system, therefore it seems this excretory power of the skin is one of the greatest benefits derived from heliotherapy. It is only logical to say the remaining fluids of a heliotherapy patient can not possibly be as toxic as those of the patient lying in closed quarters breathing his own exhausts.

In addition to these changes, the patient has a feeling of well being, increased appetite, and has something to look forward to each day. He becomes interested in life, hopeful, and feels that something is being done to restore him to health.

Heliotherapy is merely a cofactor in the treatment of surgical tuberculosis, and should, in all cases, be used in conjunction with orthopedic good sense. That orthopedic supervision in these cases is required is no longer a matter for controversy. We need only to look about and see the results of healed tuberculosis. The usual sight is a severe hunch back, a foot in plantar flexion, the shoulder fixed to the side until the pa-

tient is handicapped to the extent of dressing himself only with help. We have all seen the flexed and adducted thigh with internal rotation of the entire extremity. These deformities can be easily overcome if given the proper appliances. These appliances serve two purposes, as they prevent deformities and are usually so arranged to immobilize or put at rest the part involved.

The mechanical treatment of these cases is built around the one classical treatment of tuberculosis which we all know is rest. To obtain this there must be either immobilization or disapproximation of the parts involved. The method most comfortable to the patient is indicated, provided it does not exclude the body from the air and prohibit activity of the member diseased.

Plaster casts are not used on our patients for immobilization, except as shells. I believe the reasons are clear for this. The sealed up cast is perhaps our best immobilizer, still we must not forget our sluggish physiology whcih is the result of such an appliance. We all have our mental picture of the patient with tuberculosis of the hip or knee at the time of removing the cast. There is an atrophy of the entire member; the skin is loose and flabby, and flakes of desquamation give anything but a picture for hygeia. Not infrequently there are pressure sores and pus, even when the cast is applied with the greatest skill and experience. Note, in the roentgen ray examination, the osteoporosis, which is in itself indicative of wasting and atrophy.

Our leading authors in heliotherapy have concluded, I believe, that a consistent and progressive improvement does not depend entirely on either the extent or the site of the disease, but rather on the ability of the organism to defeat the destruction of tuberculosis. To enable us to defeat the destruction we need the help of every member of the organism and it is of little help when trapped in a plaster cast.

For these reasons the various types of extensions, plaster shells and sand bags are substituted.

Heliotherapists it would seem, are rather prone, or liable, is perhaps the better term, to become radical and denounce any benefit derived from surgery. This we must guard against, as our results depend on a combination of factors such as rest, fresh air, nourishing food, uninterrupted heliotherapy, orthopedic good sense and certainly surgery when indicated.

For years the southwest has drawn more than its quota of pulmonary tuberculosis. Sanatoria are provided for such cases by the government, the state, the county and by private interests. There are no such institutions for those maimed by tuberculosis, even though we know they respond more quickly than do pulmonary cases to our climate. They have been looked upon as hopeless patients and they have not been sought after as the pulmonary patients have been.

In the southwest today we are obtaining very encouraging results with the sun cure in extrapulmonary tuberculosis. This, as in the Alps, is due to our climatic conditions. The weather bureau gives the following reports in and near El Paso, Texas: Average humidity 40 per cent, average rainfall 9.36 inches, average temperature 63.5 degrees, altitude 3762 ft., 331 days of sunshine in twelve months.

An average of 40 per cent humidity indicates less absorption of ultraviolet rays and more rapid evaporation of perspiration. This is refreshing to the patient and enables him to receive more sun. Rainfall amounting to 9.36 inches simply means more sunhsine. An average temperature of 63.5 degrees enables exposure of the nude body even throughout the winter. An altitude of 3762 ft. enables the patient to be exposed to a greater intensity of ultraviolet rays for reasons with which we are all familiar.

Before any comment is made on the last and most vital factor, I wish to quote from Dr. Strandberg[1] of the Finsen Medical Light Institute: "The sun unquestionably is the best of all sources of light in places where sun is available. In large towns or their suburbs, sunlight is of little practical use on account of the dusty, smoky quality of the atmosphere which absorbs the chemical elements of the sun."

In El Paso, sunlight is thrown upon us with untiring generosity for 331 days in the year. This speaks for itself in the treatment of surgical tuberculosis. We expose the patient's nude body consistently and progressively and without interruption the entire year.

Artificial lights are not used in our sun treatment of such cases in El Paso, for reasons which may be seen in the following experiment carried on in our sanatorium by Dr. Orville Egbert[2].

Five groups of patients were studied with the idea of comparing the effects of artificial and natural light and the development of a graduated technic. The first group showed that patients receiving radiation from a mercury vapor quartz lamp, in a room otherwise dark, and with their bodies covered at all other times with dark clothing, developed a dry, toneless, desquamating skin, showing neither blush nor increased capillary circulation. The skin was of a dirty grayish hue

with little, if any, increase in pigment deposits. The dry epidermis could be easily crimpled on the corium.

Patients in group two, with all clothing removed were placed on open porches where there was an abundance of reflected light, but never in direct sunlight. For want of a better name this will be referred to as an air bath. This bath was rapidly increased as the only care necessary to be taken is in the gradual adaptation to temperature change. Their skins developed increased tone, a blush of increased capillary circulation, oiliness and an epidermis hard to crimple on the corium. At this stage mercury vapor radiations were added to their air bath with the results that the skin changes became more marked and pigmentation developed. On a scale of four it was possible to attain a second degree skin, but no more.

In group three the patients were given direct sunlight according to the Rollier technic. Most cases developed favorable skin as evidenced by softness, increased tone, increased capillary circulation and pigment. A few developed pigment alone and not the favorable changes of the majority. At the end of six months' period patients of this group had attained at least a third degree pigment, a deep skin of increased tone to where it was impossible to crimple the epidermis on the corium over most of the body; it was soft and glistening, due to noticeable oil in the skin. These cases would classify as third and fourth degree pigmentation.

Group four consisted of a few cases that had attained at least a third degree pigmented skin under sunlight and were then suddenly withdrawn from sunlight in an attempt to hold their skin changes with the quartz lamp alone. The pigmentation rapidly faded, the skin became dry, toneless and desquamating.

Group five comprised patients on full sunlight therapy with skin in third degree, or more, who discontinued insolation and resorted to air baths and quartz lamp radiation. Their skins faded possibly to a second degree of both pigment and texture.

While pigment was formed in sufficient quantity in those patients receiving artificial light, there was no evidence of tone; the thickness of the skin had not increased and certainly there was no evidence of a functioning skin.

Since those patients exposed to neither direct sunlight nor reflected light did not develop characters of a promitive skin it seems that something more than ultraviolet rays is needed. Temperature change and air motion play their parts as well as the solar spectrum.

I have selected five patients from our groups to illustrate the need for proper supports and supervision and to show the benefits derived from this treatment.

CASE I. G, M. AGE 2

Family history: Grandfather died of tuberculosis. Mother was actively tubercular at time of delivery. Mother nursed patient for two months when she was diagnosed as far advanced tuberculosis.

Present Illness: About April 24th, the patient became less active and did not care to take part in daily play. Patient remained sitting most of the time. Refused to pick up toys from floor. Later began crying out in sleep. Temperature 100.6 degrees.

I was called in consultation. A diagnosis of early Pott's was made of the third and fourth lumber vertebrae, after routine examination. The patient was put on Bradford frame and systematic sun instituted. The patient was relieved at once of the pain and a change for the better set in. Uninterrupted heliotherapy continued for twelve months, the patient getting three and four hours daily. Roentgen ray examination at the end of this per iod shows the disease to be arrested at once. The two vertebrae involved show a complete ankylosis. This patient was exposed repeatedly to influenza and to acute rhinitis in the family, without contracting these highly contagious diseases.

CASE II. G. O.

This patient has been under supervision three months and is reported to show the necessity of proper supervision. He was in the hands of one of our leading surgeons and progressing to happy recovery when the parents put the patient in the hands of a brace maker. The results were clearly shown on x-ray examination. There was an extensive involvement of the upper lumbar vetrebrae with repair well advanced. There was only a slight kyphosis. Patient was braced to overcorrect deformity, but the area of disease being fixed a backward displacement of the entire trunk, at the lumbo-sacral junction. resulted. This backward tilting of the trunk was some 20 or 30 degrees. The brace was discarded and patient put on corrective exercises. He is slowly assuming the erect position.

CASE III.

S. O.,Age 40—was first diagnosed in January, 1919. He was advised to have a fusion of the spine, which he did immediately. The patient states he was relieved soon after his operation and returned to his duties in five months. Five years later the patient began having pain in the right shoulder. He was treated nine months for neuritis. Roentgenogram showed tuberculosis of right shoulder. The member was immobilized for twelve months in bed. I saw the patient in January, 1929. The shoulder was firmly fixed to the side. The hand was atrophied and all fingers fixed firmly in extension.

This patient's history is reported to show the results of surgery in the treatment of Pott's disease. The patient returned to his duties in five months following his operation. Here again is brought out the necessity of immobilizing the extremity in the position which will be of most use to the patient in case of ankylosis.

CASE IV.

Mr. I. B. Age 31.—This patient experienced his first discomfort in the back during January, 1929. He was admitted to the hospital for observation and a diagnosis of Pott's disease of the twelfth dorsal and the first lumbar vertebrae was made. He

was admitted to an army hospital where a plaster cast was applied. The patient remaintd in hospital ten months exposing himself to ultraviolet lamps. He requested that sunlight be substituted. This could not be done. The patient left the hospital against the advice of the attending physicians and returned to El Paso where systematic sun was given for six months.

I was first called in consultation in April, 1928. There was only a slight kyphosis and no disability. X-ray showed a compete fusion of the two vertebrae.

No support has been used by this patient in fourteen months.

CONCLUSION

While heliotherapy at an altitude is one of the major factors in the cure of extrapulmonary tuberculosis, it must be carried on in connection with rest, fresh air, nourishing food, proper mechanical appliances, and surgery when indicated.

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DISCUSSION.

DR. C. H. GELLENTHIEN, Valmora, N. M., (opening): Discussing a paper on this subject is a good deal like discussing psychiatry in that most of us do not know what we are talking about and we do not know what we are using. In pulmonary tuberculosis we have no proof that heliotherapy does any good, neither have we any proof that it does much harm. We do know, however, that in bone tuberculosis, it is almost specific. Dr. Goodwin seems to think that all the beneficial effect comes through the absorption of the ultraviolet ray through the skin. Whether the effect of the sun, or heliotherapy, is due to the air or to the sun itself is a much discussed question. Rollier summed up the benefits of the sun treatment in three ways. He claimed one-third of sun treatment was due to the specific action of the sun on the patient's body, one-third to environment effect and one-third to unknown factors.

DR. KARL MENNINGER, Topeka, Kansas: I enjoyed this paper very much, but of course it is hard for those of us who do not know about these things from a great deal of experience to know what benefit is derived from the ultraviolet ray and heliotherapy. We have been carrying on experiments at our sanatorium to determine how much ultraviolet light will replace sunlight, of which some of the patients in the institution may be deprived for a period of time. We give our patients routinely (all mental cases and children) ultraviolet light, and while we think it does them some good, we have found it certainly is not equivalent to getting them out in the sunlight, even though our altitude is lower. However, we notice that the psychic effect is something and I must say the psychic effect seems to be doubled. It also has a kind of soothing effect on some individuals and quite a few of them go to sleep. It does affect their skins, as Dr. Goodwin pointed out. We either have to use ultraviolet rays or else no light at all during certain days in the winter when there is no sunshine in our part of the country.

DR. F. C. GOODWIN (closing): In response to Dr. Menninger's question with reference to the use of ultraviolet rays in certain constitutional disturbances, I wish to say I have not been using ultraviolet rays are almost specific for rickets, in other violetrays are almost specific for rickets. In other patients where there is a disturbance in the endocrine system ultraviolet is beneficial; however, the results are far inferior to those of sunlight. Severe cases of rickets are unheard of in El Paso.

It seems Dr. Gellenthien did not quite get my point because I stated that too much credit was attributed to ultraviolet rays in the treatment of bone and joint tuberculosis.

THE TREATMENT OF FRACTURES

JOHN E. BACON, M. D., F. A. C. S.
Miami, Arizona.

(Read before the thirty-eighth annual meeting of the Arizona State Medical Association, at Prescott, Ariz., April 18 to 20, 1929.)

The complimentary invitation of your program committee to present a paper at this meeting specified that the subject should be one of interest to medical men as well as to surgeons. I do not know of any subject of more practical interest to all of us, in these times of swift and reckless transportation by water, land and air, than that of fractures. Never has the number of fractures been so high or their forms more bizarre than in recent times. The general practitioner, especially on main lines of travel, but everywhere, sees more fractures first than ever before; and because the fate of a patient with severe lesions, especially multiple and compound fractures, may be determined by his first dressing, the more alert we are to keep abreast of the latest trends in treatment the better our results will be.

EQUIPMENT

Every doctor's office should have a few indispensable articles on hand ready to take on the emergency call: A packet containing sterils rubber gloves, sterile hypodermic syringe and ampules of morphine grains ¼, morphine grains 1/6 and atropine grains 1/150, sterile gauze rolls and sponges large enough to cover the head and large wounds elsewhere, a tourniquet, some emergency tubes of catgut with needle attached, a few sterile forceps and scissors, both gauze and heavy muslin bandages, safety pins, a Thomas leg splint, a Thomas arm splint, and a few wood splints for extremities, two rolls of absorbent cotton, and a roll of 2½ inch adhesive plaster. A more ridiculous sight than a doctor rushing to the scene of a severe accident armed with a stethoscope and a medicine case, is hard to imagine, but not so hard to see. With the listed articles, a satisfactory dressing for transportation may be done.

EXAMINATION

First, make an estimation of the general condition and the degree of shock; second, look for blood and cut away clothing to ex-

pose wounds and compound fractures—cover all with plenty of sterile gauze and bandage. Suspect and examine for fracture of the skull, crush fractures of chest and pelvis and spine. If any of these are surely present, keep patient warm, give morphine and arrange for ambulance if possible. It is poor practice to bundle a seriously injured person into any old car handy and rush over rough roads to the nearest hospital. If no ambulance can be had, one may be improvised by lashing two boards to the back of the front seat and to the rear one, in most cars, and great speed is mistaken kindness. If none of these regions are involved, but fractures of extremities are found, apply the Thomas arm splint or leg splint, short wood splints well padded, and the patient can ride in more comfort, with less shock, to the nearest best hospital.

DIAGNOSIS

Systematic examination of the entire body should be the rule. Multiple fractures are common and several may be overlooked in the presence of a major lesion. X-ray in two planes every suspicious part. The use of the x-ray in the diagnosis of fractures is now mandatory and it is a very courageous man, as well as a very foolish one, who attempts to treat any fracture without x-ray studies. In 1927, there were reported in the Journal of the A.M.A., fifty-six cases of suits for malpractice in which the failure to have x-ray study was the determining factor against the doctor, and quite probably there were many more than that.

HOSPITAL CARE

Most fractures should have hospital care, for a few days in the case of ambulatory cases, until recovery in the major cases, for anesthesia, for x-ray, for overhead frames, traction appliances, for nursing, for medicolegal reasons, for the best interests of the patient. The way to start any fracture on its best course for a good result is to keep it still for a certain period of time and this is more certainly accomplished in a good hospital.

FRACTURES OF THE SKULL

All suspected cases should be x-rayed. Fissure fractures without signs or symptoms of intracranial pressure, usually recover without interference. Depressed fractures of the vault require elevation. Compound fractures require exploration. Fractures through the base usually do not require operation. Lumbar puncture is a useful and comparatively safe diagnostic procedure. Consultation with an eye, ear, nose and throat man is desirable. A neurological examination after recovery should be made and findings recorded.

BONES OF THE CHEST

These cases require careful study. Subcutaneous emphysema and hemoptysis indicate injury of pleura and lung. Massive hemorrhage into the pleural space is quite common. Treatment is expectant beyond absolute rest in bed and careful nursing; strapping with adhesive plaster may well be deferred until the patient becomes ambulant.

PELVIS

This is now a common fracture. In the absence of injury to bladder, ureter, rectum or bowel, the treatment is good nursing, absolute rest in bed, preferably on an air or water bed. We do not employ any fixation in these cases and the results are surprisingly good. In the presence of visceral injury, exploration should be done as early as possible. The mortality is essentially that of concomitant injuries and the complication that may ensue.

COMPOUND FRACTURES

The treatment of any compound fracture requires the aseptic technic of an operating room, after the first-aid dressing, nothing should be done until ready for the final treatment in the hospital. There the wound is exposed, the surrounding tissue cleaned, the part draped and the wound thoroughly searched for foreign bodies. All devitalized tissue is trimmed away, and the wound either closed primarily or treated with Carrel-Dakin solution according to a very exact technic. Thereafter the treatment of the fracture itself begins.

In fractures of the long bones reduction to proper alignment in a functionating position is best attempted under full surgical anesthesia, with fluoroscopic control, at the earliest time possible. In cases where either is contraindicated, local anesthesia by nerve blocking may be employed very successfully in many cases. Many poor end results have followed failure to employ anesthesia at the first attempt at reduction and in our work we always use it in fractures of humerus, elbow, both bones of the forearm, Colles' fracture, also in fracture of the hip, femur, both bones of leg, and Pott's fracture. If the primary treatment is given before swelling has occurred and an accurate reduction accomplished then, the battle for a good result is more than half won.

It is obviously impossible to describe treatment for each major fracture in a twenty-minute paper; therefore, under each heading the most important points only will be mentioned.

HUMERUS

Methods of treatment must be adapted to the individual case. Fractures of surgical

neck and tuberosities demand fixation in outward rotation, as a rule. Shaft, Thomas arm splint with extension—airplane type of splint—Jones arm splint with extension, occasionally plastic cast. Non-union is to be thought of here and the type of fixation should be efficient.

ELBOW

Mostly in children—epiphyseal separation most important. Reduction under fluoroscope. The acutely flexed position answers for most cases but not all. Fracture of condyles, Y fractures into joint, require careful checking after manipulation and much interest in after care. Fractures of olecranon may usually be treated in full extension with good results. Full function of extension and flexion comes slowly in from three to four months to a year or more.

BOTH BONES OF FOREARM

Upper and middle thirds, one of the hardest problems to get both bones end to end and keep them there long enough to unite. Reduction under fluoroscope with full anesthesia. If the ulna can be reduced end to end partial contact will suffice for the radius. The ulna is the important bone of the mid third and upper forearm. Anterior and posterior plaster splints moulded to fit and held until dry usually suffice. If not, extension in Thomas arm splint usually will.

LOWER THIRD AND COLLES' FRACTURES

These require anesthesia and fluoroscopic control and most thorough and painstaking reduction. Impacted fractures should be broken up and fully reduced, taking care that the styloid of the radius shows well below the styloid of the ulna. The radius is the important bone here and reduction must be accurate. An important part is to secure the lower end of the ulna in its proper relation to the radius, upward deformity being common and disabling. The ligament will heal as fast as the bone does, but no faster. Treated in moulded plaster or some form of special splint of metal or wood. Movements of fingers and thumb from first day, out of splint at two weeks for active movement. All support off at three and one-half weeks. To work at eight to ten weeks.

CARPAL FRACTURES

These require x-ray diagnosis. The scaphoid is the bone most frequently injured. Dislocation of the semilunar forward beneath the flexor tendons occurs in a small number of cases and can easily be overlooked. Treated in dorsiflexion with the hand in functioning position. Immobilization for three weeks, as early movement here tends to non-union.

METACARPAL FRACTURES

Treated by reduction under fluoroscope and fixation in any dressing that holds the reduction. A certain number require extension in a banjo splint to prevent visible deformity. Same remarks apply to phalanges. Palmar angulation is common and must be reduced and held, as it prolongs disability unduly.

FEMUR

Neck. These occur mostly in elderly people who do not stand confinement to bed very wel. The best method of treatment is reduction by Whiteman's method and fixation in a heavy spica cast in that position. When this cannot be done, we have to do what we can by extension, sandbags, and what not, expecting a fibrous union with shortening, which is better than a funeral due to treatment of an elderly cardiac, nephritic or diabetic in a cast. Younger people bear the Whitman cast very well and the percentage of good results is fair around sixty per cent.

SHAFT

Shaft. These fractures are best treated in a Thomas splint with a skeletal traction. The greatest advance in handling these cases that came in half a century was the development of a technic for pulling directly on the bone by Steinman pin through the lower end of the shaft or by ice tong calipers. If the lower fragment is brought into line with the upper and sufficient weight employed, nearly all fractures of the bone can be reduced to good contact, good alignment and full length. Practically the only indication for operation on this bone is the certainty of soft parts intervening between the fragments. A word of caution is that it is easy to overextend. When you can see a light streak between the fragments on your x-ray plate it is overextended and non-union may result. A case in a Thomas splint should be checked twice a day by a surgeon.

Condyles. Reduction by manipulation under fluoroscope, extension by Steinman pin through crest of tibia, is feasible. If reduction cannot be made and retained operation should be considered.

PATELLA

Those cases which show separation of the fragments are best treated by operation with suture of the capsule and lateral tears; fissure and chip fractures are treated by simple immobilization with early movement.

BOTH BONES OF LEG

Accurate reduction of the tibia is essential here. The fibula can be left with only partial contact. Here again the method of choice is treatment in Thomas splint with skeletal traction through the os calcis by

Steinman pin. Non-union may occur here and overextension should be watched for. Consolidation of fractures of both bones of leg is much slower than when one bone is fractured and sometimes movement is started too soon.

POTT'S FRACTURE

As in Colles' fracture, this requires the most painstaking, accurate reduction under full anesthesia and fluoroscopic control. Failure to fully replace the astragalus in reration to the tibia, or to fully invert the foot, makes for serious disability for a long time. After accurate reduction it can best be held by the Stimson plaster splint. Cast off at two weeks for gentle anterior-posterior active movement, daily massage with light treatment, all support except snug bandage off at six weeks. Weight-bearing at eight to ten weeks, in a shoe with the inner border of the sole elevated one-half inch to keeq a moderate degree of inversion for six months. Support of the arch when beginning to walk is advisable.

TARSAL BONES

Fractures of the astragalus, os calcis and scaphoid are quite frequent and produce many bad results. Careful diagnosis, moulding under fluoroscope, which does not lend itself to this region so well. Checks by plates are essential. Reduction of impacted fractures of os calcis is very difficult. It may be necessary to pass a Steinman pin posterior to the Achilles tendon to aid in traction and in certain cases the tendon must be severed or lengthened. When the inferior calcaneo astragaloid ligament is torn a disabling flattening of the longitudinal arch accurs. These cases require most careful study and management. Weight-bearing should not be hurried. For the general practitioner, consultation with an orthopedic surgeon is desirable.

METATARSAL

These fractures are quite common and frequently compound. Careful sterilization of the wound without attention to the fractures seems best, as, if infection develops in the deep structures of the foot, great damage is inevitable. The bones may be extended by temporary extension on the toes and the fragments moulded into place. End to end apposition is unusual and contact suffices if great care is used to correct or prevent plantar angulation. The arch should be supported in the after care, for several months.

PHALANGES

These are treated in the same way, guarding against plantar angulation.

SUMMARY AND CONCLUSIONS

Attention is invited to the great increase in the number of cases of injury exhibiting fracture—oftentimes multiple fractures—and to the serious nature of such injuries.

Certain equipment found to be indispensable in the emergency is recommended as a necessary part of the doctor's office supplies, especially along main highways.

Hospital care for diagnosis and treatment of all serious fractures is desirable, but operative reduction is discouraged except in unusual cases where the indication is clear and imperative.

Early reduction of fracture of the extremities under full surgical anesthesia and fluoroscopic control, with skeletal traction where feasible, promise best results.

FUNCTIONAL MANIC DEPRESSIVE PSYCHOSES

DR. H. A. LaMOURE,
Pueblo, Colo.

Read before the New Mexico Medical Society, at its Forty-Seventh Annual Meeting, Taos, New Mexico, June 12-14, 1929.

A comparatively few years ago a psychiatrist hesitated to address a group of medical men on a subject related to his specialty because the general practitioner took little or no interest in mental diseases. I am glad to say that this attitude has shown a marked change and the close relationship between mental and physical diseases has been recognized. The importance of the early diagnosis of a mental condition in its effect on the prognosis has also been brought to the attention of the general practitioner. However, if we look over the papers read in meetings, such as this, we find that the majority of those which deal with psychotic conditions cover only those forms of mental disease which have an organic basis such as paresis or cerebral syphilis, and which, because of this organic causation have naturally a greater interest to the medical profession at large.

It is, therefore, still with some degree of hesitancy that I am bringing to your attention the manic depressive psychoses which are functional rather than organic. As you know, the classification of mental diseases has changed greatly in the last quarter century. You all remember the old classes of mania and melancholia, and I fear we were all too ready to make these a dumping ground for many cases which we now know should have been differently diagnosed. We owe to Kraeplin the bringing together of mania, melancholia, circular insanity, periodic insanity and recurrent insanity into one great class to which we give the name of manic depressive. The outstanding features of these psychoses are that recovery from an attack is usual and

that a second or even repeated attacks are to be expected. It is also considered that an hereditary predisposition is usually found which requires an exciting cause to produce the acute symptoms. My own experience has, however, not proven to me that any great importance can be attached to this hereditary factor.

Closely allied to these psychoses are those cases we term involutional melancholia which differ from the manic depressive psychoses in the fact that they appear later in life, that there is one attack which is usually more prolonged, and that recovery is doubtful. As the name manic depressive implies, we have two types of cases—the manic on the one hand and the depressed on the other. Theoretically, we would expect that the manic type would exhibit opposite symptoms to that of the depressed type, and in typical cases this is so, but typical cases are rare, and we usually find a combination of symptoms forming a third type which we call mixed.

The following cases will serve to bring to your attention the most important symptoms which are usually found.

A few months ago I was notified by wire that a patient was to arrive on a certain train for care at Woodcroft Hospital. Accompanied by a nurse, I met the train and found in the drawing room of the Pullman a comparatively young woman, unclothed with the exception of her night dress, in constant motion and talking incessantly. It required the combined efforts of the nurse, brother-in-law and myself to wrap a coat about her and carry her from the train to the car. Her husband, who accompanied her, was so overwrought with grief over her condition that he was practically of no help. After reaching the hosptial it required several nurses to convey her to her room. The history, as given by the husband, elicited the fact that nothing wrong had been noticed until about a week before, when she had fallen down a flight of stairs, but sustained no injuries other than bruises. Following this fall she became irritable, wandered away from home and began to talk in a foolish manner. Her motor excitement continued for several weeks, rest and sleep being obtained only by administering sedatives. Hydrotherapy had very little effect. Her flow of talk was extremely incoherent and she exhibited marked flights of ideas, with considerable rhyming and punning. Everything about her seemed to attract her imagination and provoke a remark. She also sang considerably, wording her singing with the same rhymes which she would mention in her flight of ideas. Unless restrained in bed, she would usually throw the upper portion of her body on the floor and attempt to roll under the bed. Considerable trouble was experienced in getting her to take sufficient nourishment, her only expressed desire being for fruit. On several occasions it was necessary to tube feed her. She lost considerable weight and for a time it seemed possible that she would exhaust herself. This condition continued more or less continually for practically two months; then she began slowly to become more quiet, more coherent and her appetite began to return. About six weeks ago her improvement became more rapid and for the past month she has been practically normal and was recently discharged to go home.

You can readily see that the above was a case of the manic type of the manic depressive psychoses. This case presents two of the outstanding symptoms of this type; namely, the motor activity and the flight of ideas. Another symptom which is usual in these cases, but not presented by this one to any degree, is a feeling of euphoria. While at no time was she ever depressed and always appeared happy, still there was none of the extreme exuberance which accompanies these cases.

Now let us turn to another case which presents a very different aspect:

There was brought to the hospital a man, fifty-nine years of age, professionally a chiropractor. His history showed that he had been overworking for many weeks, that he had become nervous and irritable, and that his relations with his wife were not pleasant, owing to the fact that she was very nagging and insanely jealous. He also had been worried over the fact that a new chiropractor had moved to his town and was afraid that he would lose some of his practice. This man was extremely depressed, was laboring under the delusion that he had done things which his license would not allow, and that the state board was going to prosecute him and take his license away. Previous to admission he had made an abortive attempt at suicide by taking some solution the character of which could not be learned. For some time after admission he was quite agitated, would walk up and down the hall or sit down and moan. If asked how he felt would always reply, "Oh, wretched," and declare that there was nothing ahead for him. He also at times wept considerably and expressed a desire to die. When questioned, his replies were very slow and it took him considerable time to make a reply. On the whole he presented a perfect picture of despair and was considered a very bad suicide risk. His handwriting was very shaky and laborious. Several infected teeth were removed shortly after admission. After about six weeks he began to show improvement, which was progressive, and three months after admission he was in a practically normal condition. He seemed happy and anxious to get back to his work, although he had considerable insight and knew that has was not as capable of doing as much work as previously, and he was also fearful of the result if he went back to his old environment, particularly his taking up life with his wife again. The following is what he recalled of his psychosis at the time he left the hospital: Had been having considerable headache since flu in 1928. For several weeks before admission noted that he was very absent minded, could not concentrate and that this was much worse when his wife nagged him. His recollection of the few days preceding his admission and quite some time following during the acuteness of his depression was "just like a dream," and he can give no sequential account of it. Only faintly recalls taking medicine to kill himself. Does not recall arrival or admission to Woodcroft. All events about that period are hazy and dreamlike to him and most are not recalled. His daughter came down from Denver to see him, but he does not recall how long this was before he was brought to Woodcroft. Recalls that the idea of killing himself has come to him several times. "It seemed like some one was after me. I was worried about my practice. Seemed like

I was going to be killed, but I didn't know what for. I remember here they put me in the hall and I thought I was going to be electrocuted. I could hear them fixing the chair. Tony was to be the executioner. I thought or dreamed I was dying on this lake out here one night; I had a feeling I was dying."

The above presents a picture of the depressed type of these psychoses. Here we note, in contradiction to the symptoms shown by the case of the manic type, instead of a flight of ideas we have a dearth of ideas and delusions of a depressing type, and while I mentioned the fact that there was some motor excitement in his pacing up and down the hall, still the greater part of the time he showed motor retardation, either lying on the bed or sitting down with his head between his hands and moaning.

I am now presenting a case which is very much of the mixed type:

This was a man, 47 years of age, a barber by trade before admission to the hospital. He has been more or less depressed for about fifteen months, but had been very successful in his business and had saved some money although he had lost about eight thousand dollars playing the stock market. After sustaining this loss he was married to a woman twenty years younger than himself and this added to his worry because he was unable to provide the home she expected and was forced to live in furnished rooms. His depression increased to the extent tha the lost all interest in his business and had to give it up. He stated that he suffered day and night because of this depression. He could not afford to go to a private hospital and refused to go to a state hospital. At last with a feeling that he could not stand it any longer he attempted suicide by cutting his throat with a razor. He did not succeed however, and was brought to the hospital, his throat practically healed. As soon as he was able to be up and about he presented anything but a picture of depression. He was happy, jovial and rather euphoric, and shortly afterwards was paroled into the custody of his wife. He had not been out of the hospital more than thirty-six hours when he again cut his throat. He was not successful this time either and was taken to a general hospital until his throat healed and then returned to the state hospital where he remained for a number of years. He was then transferred to a private hospital and later released apparently in a normal condition. During the years that he remained at the state hospital he was apparently perfectly contented and more or less euphoric. Other than at the time he was giving us his history this man never showed any symptoms of depression or exhibited any delusions.

The last case which I wish to bring to your attention is that of a man fifty-two years of age.

At the time he was admitted he was a mine owner by profession, a very intelligent, high-bred gentleman who had, in company with several partners, extensive holdings in Old Mexico. Because of one of the frequent changes of government in that country he had lost all his property and had practically no resources left. He was placed in a private hospital for a short time, then committed to the state hospital. He exhibited extreme motor retardation, sitting in a chair almost constantly and hardly ever moving unless urged. He was disoriented in all fields and answered questions if pressed, but the answers were very slow in coming. He did repeat the words "dying, dying," and "standing, standing," over and over again. He was always quiet, orderly and gentlemanly. He continued in this condition for eleven years when he suddenly began to improve, the improvement being very rapid. He remained nearly a year at the hospital after his recovery, coming and going as he pleased, and after being released engaged in business and is now a traveling salesman. This is one of those cases of involutional melancholy which fortunately recovered, but which you ntoe occurred rather late in life and ran a very prolonged course.

You must understand that these cases, which I have recited, are average cases, and that in both types we meet with widely differing cases depending upon the severity of the symptoms. I am not going deeply into the symptomatology of these psychoses, but will briefly mention the outstanding symptoms which we most often meet.

In the **manic type** the chief symptoms to be expected are motor excitement, flight of ideas and euphoria. In addition to these we often find that they are very impulsive in their reactions and pass rapidly from a jovial mood to an ugly one, and then are apt assault the person nearest them. Their judgment is poor and they are inclined to enter into the most absurd financial transactions. They have an exaggerated idea of their capabilities and express themselves as being able to accomplish the most extreme feats. Their delusions are chiefly of a grandiose type, not, however, to the fantastic degree that are those of a paretic, but having to assault the person nearest them. Their the impossible.

The depressed type, on the other hand, exhibits as its principal symptoms, motor retardation, inhibition of ideas and sadness. Delusions are of a painful character, the most frequent being that they have committed a great sin, that they have injured someone or they have committed the unpardonable sin against God. The psychic pain in many of these cases is terrific, and no other form of mental trouble carries with it so much actual suffering. These same symptoms also apply to the involutional cases. At this point I wish to mention the matter of suicide, and to impress upon you that every depressed case, no matter how slight may be the degree, is a potential suicide. I also have found that the greatest danger is among the involutional cases, and, strange as it may seem, this step is most often taken when they have begun to recover.

Because of the frequent violence of the manics and the tendency to suicide of the depressed these cases practically all require hospitalization. They cannot be cared for in their homes. Occasionally the acute condition will appear with remarkable sudden-

ness, but usually there are some premonitory symptoms with which the general practitioner should be familiar because you are the first to contact these cases.

The patients themselves are usually very reticent about going to a physician, and it is generally the husband or wife or other relative who appeals to the family physician for counsel. If a relative comes to you with the story that one dear to them, who has always been of a happy disposition, has begun to show a change and now has periods of depression and seems worried without apparent cause, is always tired and takes no joy in life, who takes no pleasure in his work but rather his employment has become toilsome, who seems to find it a wearisome task to converse with friends and prefers to be alone and possibly have frequent crying spells, then the physician should realize that he is dealing with a prospective case of pathological depression.

If, again, the story goes that a perfectly average man or woman, whose reactions to life have been normal, begins to become very loquacious, constantly forces his conversation on people and talks indiscriminately about his private affairs, that he seems to have lost his judgment and has entered into foolish business transactions, has lost his sense of probity and become immoral, is overactive and sleeps but little, then we are face to face with a potential manic. In either instance it is necessary to rule out any physical basis for the change.

At this early stage it is sometimes possible to abort the attack by a complete change of environment or rest. If, however, the attack supervenes, what can be done in the way of treatment? As I have said before, these cases require hospitalization to prevent tragedy or suicide, but principally to remove them from the family influence, especially the depressed cases in which the over sympathy of the family is most harmful.

The line of treatment followed at Woodcroft is as follows:

Because of the extreme danger of exhaustion, we give our first attention in both types to the matter of procuring rest. Hydrotherapy in the form of hot packs or prolonged baths usually gives the best results, with the added use of sedatives. Of these we have found paraldehyde to be the best both from the standpoint of results and safety. Chloral, bromides and the different barbiturates are also of advantage if employed judiciously. Any physical pathology that may be found is attended to early.

The question of nourishment is perhaps of next importance. The absolute refusal of food is very common, especially among the depressed, occasionally with the manics. If this occurs we have to resort to tube feeding, using the nasal tube. This sometimes has to be kept up for weeks. After the acute stage is over we find that occupational therapy does more to hasten recovery than any other agent we have. We try to get them interested, first in the ordinary house work about the hospital, and later in our occupational therapy department where a trained teacher supervises the work in basketry, weaving, sewing, woodwork, painting and other industries.

When a case voluntarily asks for something to do we know he is far on the road to recovery. For the depressed, rest in bed for long periods is desirable, always bearing in mnid the danger of suicide and taking special precautions to prevent this.

DISCUSSION

Ques.: I should like to ask Dr. LaMoure what type of disease is represented where the first symptom is that of running away. Reference is made to the case of a Spanish man, a coal miner by trade, a good worker, but a drinking man. Before every pay-day he would get drunk, and then he took a spell of running away from home--just running off. Friends followed him, finally found him, brought him home and watched him closely, but he ran away again one night, crawling through a window. This was a very queer case and I should like to have the doctor tell me what type of disease was represented.

DR. G. W. SMITH, State College, N. M.:—I was a little surprised to hear the term "involutional melancholia" applied to men and wish Dr. La Moure would explain it. I remember sending one case to a specalist not so very long ago and the cure wrought in six months was remarkable. There is no question but what removing them from family environment, and the influence of well-minded but misguided relatives and friends, is a most important measure in the treatment of these cases.

DR. LA MOURE (closing): In regard to the case of the man who ran away from home, this might belong to the dementia precox class but I would have to know a lot more of the history before being able to give an intelligent opinion. Alcoholism might have had something to do with it, also. In these cases it is simply impossible to make a diagnosis from one condition alone.

About involutional melcancholia I think it strikes men and women exactly the same. I do not believe that menstruation has anything to do with it, other than it may just happen to come about that time. Glandular therapy has not been a benefit, at least in my experience. This is a very wide field and one that has not been developed to any extent as yet.

THE MANAGEMENT OF HEART FAILURE AND DROPSY

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(Read before the New Mexico Medical Society, at its Forty-Seventh Annual Meeting ,at Taos, New Mexico, June 12-14, 1929.)

Heart failure generally means heart disease but heart disease does not necessarily mean heart failure. Heart failure is a relative condition. A diseased heart that functions very well for a book-keeper would not do at all for a Dempsey.

The normal heart has an emergency reserve ten times beyond the ordinary requirements. A man can get along with a small piece of thyroid, one-third of a liver or one-half of one kidney. The man with one lung does not worry much; but the heart that is diseased might stop, and then where would he be? Such fears are generally unfounded. We can get along with a heart the efficiency of which is half gone at least as well as we can with one lung.

Contraction and relaxation is the inborn property of every heart muscle cell. Rythmic contraction starts with the laying down of the vascular system in the embryo and may be resumed even after death. In the Boston City Hospital a man aged 62 years died of pernicious anemia. Two and a half hours after death the heart was removed and one-half hour later the coronary arteries were perfused with oxygenated Locke Rosenheim solution. Gradually the heart began to contract. After five minutes five c.c. of adrenalin solution 1:1000 was added very slowly. In another five minutes all chambers of the heart were beating regularly at 70 per minute and did not stop until acetic acid was added to terminate the experiment. Why did this heart stop and then resume its beat outside the body? Because of lack of oxygen, overloading, and toxemia. When the gas is bad or the tank empty or the load too heavy an auto will stop. That is nothing against the machine.

Going up stairs with a rise of ten feet is equal to walking 150 feet on the level. If the ascent is made in ten seconds it is like running 150 feet in ten seconds. Sometimes all that a damaged heart needs is a sensible driver. At every beat the heart ejects three ounces of blood against a pressure equal to 120 m.m. of mercury. Every twenty-four hours 300,000 ounces of blood must pass through the heart. With every beat there is expended 20,000 g. cms. of energy. That would lift a two pound weight eight inches from the ground. The heart beats 100,000 times every twenty-four hours. Therefore it expends enough energy to lift this two pound weight 800,000 inches or twelve miles every day. By simply putting the patient to bed the heart will be saved lifting this weight one or two miles at least. That is quite a help to a failing heart.

The first principle in treating heart failure is to take off some of the load. It is very plain why restricting activity, putting the patient to bed, will enable us to secure results in the management of heart failure that cannot be secured otherwise.

When the body is too heavy it makes more work for the heart. Overweight is generally a sign of vigor in the young. In the aged it is a handicap. If a man had to carry thirty to fifty pounds of fat about with him in a bucket he would soon rebel. Excess of weight adds to the work of the heart and may be a cause of heart failure. In these cases, getting rid of obesity acts like dropping ballast from a sinking balloon.

Edema by its weight, by pressure on the blood vessels and by interfering with nutrition throws a great burden on the heart. The failing heart hardly ever is restored to efficiency so long as edema is present. After the circulatory load has been made as light as possible, we next seek to make the heart work more efficiently.

One-half of all cases of heart failure are due to auricular fibrillation. In this condition, on account of the rapid and irregular action of the heart, the ventricle has not time to fill properly and the initial tension is not sufficient to produce a maximum heart beat. Many beats do not open the semilunar valves. Hence, the heart rate is greater than the pulse rate. The beats that cause no pulse are wasted and the heart is crippled in its action.

In this condition the auricles are diseased while the ventricles may be comparatively healthy. The main fault is with the timing of the heart beat. By the use of digitalis we make the heart slower and more regular and increase the ventricular efficiency. Regulation of the rythm and restriction of activity is all that many of these patients need in order to overcome their heart failure.

The next principle in treating heart failure is to furnish the heart with the right kind of fuel. That diet is best which will furnish the most energy with the least tax upon the digestive and eliminative organs. The most efficient fuel for the heart muscle is carbohydrate. Fats and proteids are less useful. Therefore a diet for heart failure should contain a large amount of sugar. The great value of glucose intravenously in heart failure is well understood. It is not so commonly appreciated that sugar and other carbohydrates by the mouth may also help a failing heart.

We try to give a high calory diet consist-

ing of various sugars, syrups, fruit juices, fresh or canned, cereals, potatoes, cream and milk, etc.

Heart disease and heart failure are two different things. The presence of a murmur or an irregularity need not be an indication for digitalis. So long as the heart is able to work efficiently it is generally not wise to meddle with it. It is only when the individual is crippled in his activities that treatment is indicated.

CASE 1

A man aged 49 years came to the office May 8, 1923, complaining of shortness of breath, sleeplessness and swelling of the feet and legs.

Twelve years previously he had a severe attack of acute rheumatic fever and during the last two years he had been unable to attend to his work.

Examination:—He was cyanotic and very dyspneic. The pulse was absolutely irregular, 92 per minute, while the heart rate was 106. There was a systolic murmur at the apex with a diastolic rumble and the heart was much dilated. The liver was 4 cm. below the costal margin and the lungs congested at the bases.

Diagnosis:—Rheumatic heart disease. Mitral Stenosis. Auricular fibrillation.

Treatment:—He had been taking ten drops of digitalis three times a day for a long time without much relief. However, he had not been put at rest. I ordered him to lie down as much as possible and gave him codeine and veronal which enabled him to sleep. He was also given powdered digitalis (grs. I) and three grains of theocin three times a day. At the end of a week he returned with a heart rate and pulse rate of 62. The heart was working more efficiently and he felt very much better. As the edema disappeared the theocin was omitted and two grains of powdered digitalis was given daily. An attack of acute rheumatism made the heart much worse, more rapid and irregular. He was put to bed and given large doses of salicylates and later tolysin. The digitalis was continued in the same dose. He gradually improved and at the end of six months was able to continue his business again. (that of a broker) and has done so for the last six years. During this time digitalis has been administered daily.

COMMENT

In this type of heart failure the main trouble is with the cardiac rythm. The auricles are fibrillating and contract irregularly at a rate from 350 to 500 or 600 per minute, while the ventricles respond in an irregular way to the impulses coming from the auricles. Digitalis depresses the bundle of His and prevents an excess of impulses reaching the ventricle. In this way the ventricles are slowed, their action becomes more regular and, of course, they work more efficiently. The normal pacemaker is out of commission. Digitalis helps to time the ventricles. This being the case, it is necessary to give it in proper dosage continuously. The intermittent use of digitalis in these cases is a mistake, although advocated by some men of eminence. I have seen this plan of the intermittent use of digitalis result in severe heart failure. With proper dosage there is no such thing as an accumulative effect of digitalis. The heart action will improve by its use with time. Any preparation of digitalis will poison the heart if the dose is large enough.

In the patient the addition of rest took off enough of the load to enable the heart to work better.

I have not succeeded in restoring normal rythm by the use of quinidine for more than a few months. In the type of case here reported I depend entirely upon digitalis.

I have found that in acute rheumatic endocarditis the salicylates are sometimes more valuable than digitalis. It is doubtful whether digitalis is of much use in combatting the heart failure of toxic states or that of any of the acute infectious diseases. In these cases of auricular fibrillation treatment is generally very satisfactory and by proper management life and usefulness may be prolonged for many years, as has been the case with this patient.

CASE 2

An American woman, aged 62 years, was seen January 26, 1927. She was complaining of an irritating cough, inability to breathe except when propped up in bed, nausea, vomiting, dropsy and urinary incontinence.

She had always been quite well until a year ago when she had the flu. After that the feet began to swell and she had not been well since. She was passing about 4 ounces of urine a day.

Examination showed the feet and legs markedly edematous, the face and hands swollen and the abdomen about one-half full of fluid. The liver was 6 cm. below the costal margin. The heart was hypertrophied and dilated with B. P. 170/80. The blood urea ranged from 30 to 52 mg. per 100 c.c. of blood. Urine was markedly albuminous and contained a large number of granular casts. Sp. gr. from 1015 to 1025. Basal metabolism was minus 15.

Diagnosis:—Nephrosis. Coronary sclerosis. Hypothyroidism.

Treatment was begun with the usual routine of restriction of fluids. diet, rest, hypnotics, digitalis and theocin. euphyllin, purgation with epsom salts and compound jalap powder. and restriction of salt.

At first this plan was quite successful in eliminating fluid, but in a short time it ceased to produce results. After many changes and much discouragement, I finally settled down to a routine consisting of 6 grs. of thyroid, 3 grs. of powdered digitalis and from one to 4 drchs. of compound jalap powder daily. In addition she received novasurol intravenously two or three times a week or as needed. The urinary excretion now ranged from 18 to 52 oz. daily.

On account of the nephrosis she was given a high protein and low fat diet with plenty of beef steak. The edema gradually yielded, the heart action became better and her general condition improved. At the end of three months the blood urea was 24 mg. per 100 c.c. of blood.

She was kept at rest in bed for practically five months. At the end of this time the blood pressure was 150/80. The apex of the heart just outside the midclavicular line. The pulse was regular and there was no gallop rythm or pulsus alternans. The edema and ascites were all gone and the liver not palpable. There was a marked change in the patient's appearance. The face instead of being pasty and

swollen, now was animated and the color good. There was still a trace of albumin in the urine and an occasional hyaline cast. Thyroid 6 grs. daily, digitalis 1 or 2 grs. a day and purgation with compound jalap powder were continued. She remained quite well. The urinary incontinence disappeared. She died suddenly while walking in the street Nov. 15, 1928.

COMMENT

In some cases large doses of thyroid cause the edema to disappear by increasing oxidation or possibly by aiding in the excretion of sodium chloride. Marked diuresis followed each dose of novasurol.

I think the case very well illustrates the great value of this drug in edema.

I feel that the use of thyroid played a very definite role in her recovery.

In the case of an old lady with myxedema and who was bedfast with heart failure and enormous dropsy, three grains of thyroid daily caused rapid elimination of the fluid, and by the continuous use of the same dose she was able to do her work for twelve years. At times there was marked anuria, which yielded to increased doses of thyroid.

CASE 3

A Mexican man, aged 53, was seen March 1, 1929. He was complaining of dropsy, shortness of breath and inability to lie down or sleep.

Ten years previously he had aortic insufficiency and a 4 plus Wassermann reaction. After a few doses of sulpharsphenamine he felt quite well and refused further treatment. At the present examination I found the heart much hypertrophied and dilated with a prolonged diastolic murmur over the upper sternum, transmitted to the apex. B. P. was 150/60, pulse 90 and regular. The liver was palpable 6 cm. below the costal margin and the belly was full of fluid. The whole lower part of the body was markedly edematous. He could only breathe when propped up straight in bed and had to stop between words to get his breath. The urine was slightly albuminous. Sp. gr. 1018 and the daily output about 8 oz.

Diagnosis:—Syphilitic aortitis. Aortic Insufficiency.

Treatment:—He was first started on Karrel diet, purgation with compound jalap powder, theocin with digitalis and restriction of fluids and salt.

This did no good, he continued to get worse, There was so much congestion in the lungs that I hesitated to give him novasurol. Several small incisions were made in the dorsum of each foot. This resulted in the loss of much fluid and in the course of about a week he was able to rest fairly well in bed, but the feet became indurated and the incisions closed. It was impossible to keep them open. The edema was soon as bad as ever. Novasurol and ammonium nitrate were now given. The novasurol produced good diuresis but was accompanied by tenesmus and bloody stools. I changed the intravenous treatment to salyrgan which was continued every other day. Under this treatment the urinary output was one-half gallon or more daily. He was put on a high carbohydrate diet and salt restricted. The edema was greatly reduced and his general condition improved so that he could walk about the room a little without great discomfort. The heart action improved and the pulse slowed down to about 80.

COMMENT

Generally when a patient with syphilitic aortitis begins to have heart failure the end is not so far off. Letting out the fluid by incising the feet enabled him to rest and caused temporary improvement. After drainage by this method failed, death was again averted by the use of salyrgan and ammonium nitrate.

It is of interest to note that digitalis had no effect in this case, while salyrgan improved the action of the heart and the general sense of well being. No doubt this was due to the mercury acting on the syphilitic infection.

CASE 4

An American, aged 52, was seen Feb. 4, 1926, complaining of weakness, shortness of breath, sleeplessness and dropsy. He had been suffering more or less with heart failure for two years.

Examination showed a heart rate of from 99 to 100 with many premature beats. The heart was dilated and there was a prolonged systolic murmur at the apex. B. P. 120/80 with gallop rythm and slight pulsus alternans. The right pleura was about one-third full of fluid. The belly distended with ascites and feet and legs edematous. The urine had sp. gr. of 1015 with a trace of albumin. No acetone or diacetic acid. There were a few granular casts. Much to our surprise the total blood urea was 150 mgs. to 100 c.c. of blood; creatinin 4. The hemoglobin was 85. White blood cells 4000. Wassermann reaction negative.

Diagnosis: Coronary sclerosis. Nephritis. Uremia.

On the usual routine treatment he failed to improve; on the contrary he became gradually worse, developed a wild delirium, with ideas off persecution and could not be kept at rest. He was seen by Dr. McChesney who succeeded in calming his mental condition. At first, I hesitated to give him novasurol on account of the congestion in the lungs and the fear of producing an acute edema, also because of the condition of the kidneys; but as it was evident he was going to die unless something was done we took a chance. No bad result followed except bloody stools and tenesmus.

He was also given ammonium nitrate up to 150 grs. daily. A diet of fruit juices, sugar, cream, tapioca, corn starch, milk and soft greens was ordered. This contained practically no salt. According to the nurse's report he passed from one-half to one gallon of urine, on an average, following each dose of novasurol. He gradually improved and at the end of a month and a half the blood urea had fallen to 20 mgs. to 100 c.c. of blood.

At the present time he is quite well and able to attend to his business. The electrocardiogram, however, shows an inverted T in lead one and partial bundle branch block. There is no gallop rythm or pulsus alternans. The rate is 70. Blood pressure 135/86.

COMMENT

This case again, I think, shows the great value of the newer remedies for edema. Also in this case it was demonstrated that the heart did quite as well without digitalis as with it, probably because the condition was not due so much to heart failure as to nephritis.

I have had one fatality from the use of novasurol due to acute edema of the lungs.

I do not know whether the usual contraindications set down are all to be heeded or not. Recently I have used salyrgan and find that it is quite as efficient as novasurol and apparently less dangerous.

It is hoped that these few remarks may prove useful. With the general principles of managing heart failure in mind and the remedies at our command, it only remains to cultivate skill in their use.

DISCUSSION

DR. F. C. GOODWIN, El Paso, Texas: I should like to ask Dr. Werley if there are any contraindications to the use of quinidine and any unfavorable effects from its use in connection with the treatment of these cases; also in regard to the use of novasurol

DR. WERLEY: As to the dangers from the use of quinidine, I have had no bad results. If you give too much quinidine, you sometimes will get nausea and a sense of weakness and depression, but so far I have had no trouble with it. If you start in with small doses and do not get bad results with the first dose, you will not get bad results afterwards if you increase the doses gradually. I do not know about novasurol. It is, of course, a mercurial preparation and it is supposed to be contraindicated in nephritis. One o f ymitapents had nephritis and nephritis. One of my patients had nephritis and we had to do something for him and gave it to him without any harm whatsoever. A great many times I think a lot of these stories about this and that thing harming you is simply the result of somebody's imagination working overtime, and is not based upon actual facts and experience. We read a lot of stuff in the textbooks and in other books and papers about what you should and should not do. I think a great many times it is best to forget all that and do what you think is right from your own experience.

In regard to ammonium nitrate, I do not know of any contraindication for that. I use it all the time, sometimes as high as 150 grs. or more daily, and it is perfectly safe. It is not a new drug, it is in fact an old drug, but Dr. Keith of Mayo Clinic, I believe, is responsible for introducing it anew. He got his idea, I believe, from some old author away back.

DR. W. R. G. SMITH, State College, N. M.:—Dr. Werley's paper was most interesting. A paper of this kind as a rule does not arouse the enthusiasm or interest that surgical papers do and I believe that most of us do not feel competent to discuss the subject, and as we do not like to air our ignorance, leave them go by undiscussed. I want to say, however, that I enjoyed the paper immensely, feel that it is a very enlightening one, and wish to congratulate Dr. Werley upon it.

Question: Do you use digitalis in heart block and have you any specific treatment for heart block?

DR. WERLEY: Some heart blocks can be helped. Some types, especially where there is myxedema present can be helped by thyroid extract. In some cases we give remedies which will speed up the ventricles. The remedy being used right now is barium chloride.

As to giving digitalis in heart block, after the heart block becomes complete and you have heart failure beginning, digitalis is a perfectly proper drug to give. It is a common impression, or was, that if you keep on giving digitalis, you are going to do the patient harm, but I know from personal experience that is not true, or most of my patients would have been dead long ago. I give it and have had very good results. The dose must not be too large, however.

THE ADVANCE OF ORTHOPEDIC AND TRAUMATIC SURGERY

J. M. GREER, M.D., F. A. C.S.,
Phoenix, Arizona.

(Read before the Maricopa County Medical Society, Phoenix, Ariz., March 4, 1929.)

There has been the greatest advance in orthopedic and traumatic surgery since the great war, as you know, and we shall not go back of this time in our present discussion unless it might be to mention Lister's phenomenal discovery, antiseptic surgery, and its development into aseptic surgery and roentgenology, the two outstanding things that have made advancement in orthopedic surgery possible.

Roentgenology has been a most valuable aid to diagnosis and has made it possible to recognize deformities and diseases which have been unfamiliar before. De shall now mention a few of the subjects relative to orthopedic and bone surgery which have helped in the advancement.

ANATOMY OF NERVES

The coarse anatomy of large nerve trunks has contributed to the advance of nerve surgery. We know that each nerve trunk, such as the sciatic, internal and external popliteal, median, ulnar and musculo-spiral has bound up in it various bundles of fibers and that each bundle on cross section always occupies the same relative position on the nerve trunk; and, further, that it can be traced downwards until it is found to be identical with the branch to groups of muscles and to an individual muscle. Similarly, there are bundles of afferent sensory fibers from well defined areas of the skin and from joints. A knowledge of the topography of these bundles is of the first importance to nerve suture after the accidental severance of a nerve trunk. It is essential when joining the cut ends not to twist them on their long axis, but so to anchor the ends before suture that the bundle of nerve fibers in the proximal end come into contact with their normal continuation in the distal end. This knowledge, too, is an essential factor in the success of Stoffel's operation for spastic paralysis.

BACTERIOLOGY

Advance in the study of bacteriology has done genuine service in throwing light upon the problems of anterior poliomyelitis, for it has clearly established its contagious nature. Bacteriologists have shown that the virus is present in the nasal and pharyngeal mucus, that it is transmissible from man to monkeys and from monkeys to guinea pigs and that some individuals are carriers, and

therefore a source of potential danger to the community.

POSTURE

By a careful study of normal and abnormal posture we have learned the ill-effects of continued malposition upon the functions of the internal organs. A kyphotic spine and round shoulders are associated with diminished respiratory capacity, enfeebled circulation and general ill-health. More specifically, we can point to the occasional association of albuminuria and lordosis. Thus, knowing the ultimate causes of much ill-health and being cognizant of what is the normal position, we are enabled to neutralize or remove the effects of malposture.

CLIMATE

Improvement in climatic conditions such as free access to pure air, and exposure, within recognized limitations, to sun or electric light are recognized as essential factors in the cure of surgical tuberculosis. Because of this, operative interference is now relegated almost to secondary place. This with perhaps the one exception of tuberculosis of the spine in which the Albee bone-graft stands out as a distinct advance in the treatment in that it markedly shortens the time that the patient has to be kept at rest and under treatment.

WELFARE WORK

The problem of the welfare of cripples is now recognized as one of the most pressing of the present day. The Shrine movement and the establishing of Shrine Hospitals for Crippled Children, in which Dr. Michael Hoke of Atlanta, is the outstanding pioneer has accomplished much good and has placed many previously hopeless cripples in the happy and producing class and will do the same for many more. The sad thing is that their room is so inadequate at the present time that a case applying from Arizona cannot be promised a bed earlier than fifteen to eighteen months. Various states have boards of rehabilitation that are accomplishing good in the way of education for the crippled. This problem briefly is first securing the proper surgical treatment for the cripple and placing him in the best possible physical condition and bringing him back as close to an approach to the normal as possible. Then, after this has been done, to find out what he might do in the way of a vocation and training him for that vocation.

ORTHOPEDIC SURGERY A RECREATIVE BRANCH OF SURGERY

Orthopedic surgery is essentially, today a recreative branch of surgery. It seeks to replace lost or deformed parts of the body and restores functions, and this special surgery consists in such things as tendon grafting, tendon transplantation, plastic bone surgery, bone grafting and nerve suture.

ARTHROPLASTY AND ARTHRODESIS

In addition to the above, in some cases orthopedic surgery has essayed with success to restore mobility after ankylosis in such joints as the elbow joint and to a less extent in the hip and knee joints. The comparatively new operation of arthoplasty is a vindication of the claim of orthopedic surgery to be a recreative science. Further, owing to its intimate knowledge of the factors involved in purposive movements of the limbs and in locomotion, it will, when they are damaged by poliomyelitis, fix proximal flail joints, so as to enable distal joints to respond to the action of undamaged muscles in their neighborhood, thus producing a useful limb out of a previously useless member.

MENDELIAN LAW

The perpetuation of a deformity through families, even for many generations is explained by the working of the Mendelian law. One notable instance is that of the reappearance of an opposing great toe in one family since 1660.

WOLF'S LAW

Whatever may be the merits or demerits of this law, it must be admitted that it supplies us in some instances with a very valuable working hypothesis, and it does seem to solve many intricate problems.

ENDOCRINOLOGY

This has proved of great service to the orthopedic surgeon. It has elucidated dwarfism, giantism, and other hitherto unexplained departures from the developmental normal, a relatively common example being the separation of the upper femoral epiphysis in children, usually girls, about the age of puberity.

BIOCHEMISTRY

This subject has thrown a flood of light upon rickets and some other nutritional diseases. When the existence of a vitamin in cod-liver oil and other forms of fat was inferred (although it had not been isolated), we thought that we had discovered the main factor in the prevention of rickets. Some observers believe that vitamins have only a secondary effect, and have even gone so far as to conclude that their absence does not predispose to rickets. Those who argue against the predominating influence of fat soluble A in the prevention of rickets adduce the following facts: Rickets may develop on any diet, and whilst cod-liver oil will cure it, phosphorus alone will do the same. Also in animals, such as rats, it has been found that rickets may develop although the diet is rich in vitamins, provided that they are kept in close confinement; whereas, the disease may

not develop in animals kept at liberty, in spite of the fact that the diet is free from vitamins. It is now admitted that heliotherapy or the violet rays cure rickets. Rats fed on a deficient diet do not become rachitic if exposed to the sun. The absence, or rather the non-development of rickets in a child appears from the latest investigations to be due to the maintenance of the normal calcium-phosphorus balance in the body. This balance is disturbed when certain fats are absent from the diet; when the individual is kept closely confined, and has not sufficient sunshine and fresh air. It has been shown that rickety rats have less phosphorus and calcium per hundred grammes of body weight than normal; and, further, that the reduction of the amount of these substances is the same whether rickets has been produced by a diet poor in calcium and rich in phosphorus, or poor in phosphorus and rich in calcium. Therefore, it has been inferred that there may be two kinds of rickets. For diets, each having opposite calcium and phosphate values, do, when deficient produce rickets. It is not a case then of simple deficiency of either calcium or phosphorus.

Is there some intermediary substance at work? Is that substance a fourth vitamin and not identical with fat-soluble A? And is it one regulating the metabolism of bone? Does the substance produce its effect owing to the stimulus of sunlight, or the violet ray of the quartz mercury lamp? It is certain that when rickets is prevented from developing in rats (given a diet poor in phosphorus but rich in calcium) by adding cod-liver oil to the diet, or by exposure to sunlight or to violet rays, the phosphorus content per hundred grammes of body weight remains well within the normal.

PHYSICAL TREATMENT IN ORTHOPEDIC SURGERY

We are now arriving at a more correct estimate of the value of the electrical currents, constant and interrupted. In the past they have, many times, been blindly prescribed, with the result not only of no value to the muscles, but also of doing actual harm by tiring them. There does not seem to be any positive evidence to show that either primary or secondary currents have ever caused nerve cells to multiply or muscle fibers to increase in number. Except in so far as they stimulate the remaining nerve cells and muscle fibers to increased activity they are of little value.

MASSAGE

There are times when massage is useful. It has been learned that massage should be prescribed with the same minute care as the internist prescribes drugs. The nature of its application, its method and vigor, its duration, and careful observation of the results produced, whether fatigue or not, can be noted by a dynamometer. All of these should be constantly under the supervision of the surgeon. It must be thoroughly understood that it is not possible to develop one additional fiber in a partially paralyzed muscle by massage. All that massage does is to accelerate the circulation of blood and lymph, expedite the removal of the waste products of activity, and thus indirectly promote the nutrition of the undestroyed muscle substance. Carefully regulated massage under skilled supervision has an important and distinct place in orthopedic surgery. Remember that improper massage may be productive of much harm.

PHYSICAL EXERCISE

Physical exercise in orthopedic and traumatic surgery is of two kinds, as you know; namely, active and passive. In this, as well as massage, the surgeon must use care in giving directions to the attendant. If possible the dynamic capacity of the part should be ascertained. The range of movements, painful and otherwise, should be carefully measured, and minute instructions given to the attendant as to the duration and extent of the movements to be carried out, how often they are to be repeated, what results are to be aimed at and careful records kept by charts and notes.

Some surgeons do not use passive motion at all in their traumatic surgery and insist upon active motion only. They argue that the patient will not cause himself harm by moving the part himself but if passive motion is indulged in that harm may be done. One surgeon that I know spends much time personally with his patients, sitting down before them and having them imitate his own movements which are planned to bring out the function of certain parts. This applies to the extremities in particular.

X-RAY AND ORTHOPEDIC SURGERY

In a talk of this kind, although we are all aware of the value of roentgenology, I think that special mention should be made of the great help that the x-ray has been in orthopedic surgery. It has enabled us to identify congenital deficiencies and redundancies in the spine and ribs, and has thrown much light not only on scoliosis, but also has shown how frequently it is of congenital origin, which, in its turn, explains its persistence and refusal to yield to treatment. In the lumbo-sacral and sacral regions a new field of investigation and inquiry has been opened up. Sacralization of the last lumbar vertebra, or abnormal development of one or both transverse processes of the first lumbar vertebra, often combined with a wedge shaped body,

has helped to explain many departures from the normal posture, and incidentally has elucidated one of the causes of persistent sciatica.

The x-ray is invaluable in diagnosing diseased states of bone and differentiating between new growths and cysts. They have enabled us to distinguish more certainly between tubercle, syphilis, osteomyelitis, Charcot's disease, arthritis deformans and rickets, especially in the spine; and no surgeon feels justified in giving an opinion on these affections until he has made an x-ray examination. We can also check the results of treatment, as for example, after reduction of a congenital dislocation of the hip, and watching the progress of fractures. I might say here that many good men do not reduce fractures under the fluoroscope.

We are, further, enabled to recognize certain points distinctive of phases of disease. Thus, in tuberculous bone the cancellous tissue is rarefied. This appearance, however, is not peculiar to that disease, but is seen when the part has been inactive from any cause. Within the active tuberculous bone the spongy bone has a washed out appearance. Not infrequently in the case of advancing disease a focus or foci can be made out, generally within the epiphysis. The focal outlines are often irregular and their contents opaque. In retrogressive cases the focus is generally limited by a zone of compressed heavily calcified tissue. Such appearances are strong corroborative evidences of tuberculosis. If disease extends to the joint, thinning and destruction of the cartilage and thickening of the capsule are visible.

It is out of place in a brief discussion like this to go into details relative to x-ray work. However, there are a few little points that have been brought out lately that are obvious, yet have helped a great deal. One thing worth mentioning is that of taking control films of growing bones and suspicious joints. by taking the other side as well, and, in some bone conditions, to x-ray the other parts of the skeleton. Of course all x-ray men mark their films "right" and "left;" however it is interesting to note that once in a while this is not done. It also goes without saying that the general technic of roentgenographic work should be of the very best. Such as proper position when making the exposure, proper developing, proper time of exposure, etc. If this is not done bone pathology cannot be properly interpreted.

The position of parts, a ttimes, is very difficult to interpret, as for example, the last lumbar vertebra. Its relative position, so far as the first portion of the sacrum is concerned, varies much in the normal. Oftentimes, the fifth lumbar vertebra projects forward and downwards at such an angle into the pelvis that it appears atrophied and displaced. In effect, the interpretation of the condition of this vertebra is often very difficult, as the more abrupt its angle, the less is the likelihood of its correct proportions being appreciated. Many times a correct interpretation of the position of the parts can only be interpreted correctly when a stereoscopic view is taken. It is many times not enough to take views in the two positions at right angles to each other. In x-ray work the Bucky diaphragm is now too well known and too commonly used to take the time to comment upon.

IMMUNIZATION OF SCHOOL CHILDREN

By DR. R. J. STROUD, M. D.,
State Superintendent of Health, Phoenix, Ariz.

(Read before the Maricopa County Medical Society, at regular meeting, in Phoenix, on June 3, 1929.)

When asked to speak on this subject to you from a public health standpoint, I requested the privilege of calling your attention to some things which are not altogether understood by the medical profession in relation to the State Health Department. In the near future I am going to circularize the profession in Arizona directing them briefly to the best methods of reporting contagious diseases.

At the present time the method of reporting to local health officers, from them to the county health officers, and from them to the state is, in a great many instances, cumbersome. Somewhere along the line these reports are held up and often we are confronted with more or less of an epidemic too late to get the proper action and cooperation in our warnings to the various physicians. For instance, one of the county health officers reported fifty-five cases of measles covering a period of two months, and another health officer held up his report for three months. I am going to ask a little closer cooperation than this, because, as a part of the Federal system of epidemiology, we have to report each week the number of cases of the various diseases for the week occurring in Arizona. No health department, state or local, can effectively control diseases without knowledge of when, where and under what conditions cases are occurring. The late reporting to which I have just called your attention certainly does not give the authorities in Washington a proper mirror of what has transpired in Arizona during the week, and there is no way in which we can go back and change these reports into their respective weeks because the reports for those weeks have already been published in the Public

Health Bulletin. At other times a physician will telephone his local health officer concerning a disease and then fail to make a written report.

Some states have a weekly card which is sent out to physicians and which is filled in by them and sent directly to the State Health Department, covering all diseases for that week. It is not cumbersome and only the name of the case and the name of the disease are required. I am going to try to inaugurate this manner of reporting in Arizona and get away from the troublesome cards, most of which mean nothing, and none of which are read except the name and the disease. In the states where this method is used, the city health officer and the county health officer are not troubled with keeping track of all of these cards and forwarding them to the state health department. However, Section 4392 requires physicians to report in writing to the local health officer and as long as this is in force it would make only more work to ask the physician to duplicate the substance of these cards. All of Section 4392 is not lived up to, by any means, for I doubt if any attending physician reports "not less than twice a week to his local board the condition of his patient," as this section requires. When such regulations as this cannot be lived up to it seems that the simple method of reporting by telephone to the local health officers that they may quarantine, less confusion would result and the State Health Department would know the exact condition of the state as far as health is concerned.

Another thing which has occurred to me is that each city and county could make laws governing immunization of dogs against rabies, and enforce them. So many dogs which are pets have bitten children during the past few years and jeopardized the lives of these children, that we should be alive to the fact of prevention, even as we are alive to the fact of vaccination against smallpox.

It is my intention as soon as we have prepared sufficient articles so as not to break the sequence, to carry an article each week in the leading newspapers of this state selling prevention and selling medicine to the people of this state. The press have kindly consented to cooperate and I should like to have the various physicians send articles to the State Health Department which may be of value, limiting these to one and one-half, standard, double space pages.

Now to go on to the subject of "Immunization of School Children." The three diseases in which there has been an outstanding immunity conferred by vaccination are smallpox, diphtheria and typhoid fever. At the present time too much smallpox is being reported, especially from Maricopa County, and too few people are being vaccinated. In my connection with the Indian Service the government insisted that all children be successfully vaccinated during their first year of school and this has been more or less faithfully carried out. Therefore, we do not hear of smallpox spreading among the Indians. I have been told by teachers and other observers that in certain parts of the country where smallpox has not happened to occur for some years, perhaps not one per cent of the children in all grades from kindergarten to high school have been vaccinated. Now this is largely the fault of the individual physician in not calling attention to the fact that certain children under his care have not been vaccinated, and in these days when we have again become a nomadic race because of the automobile, these children may travel to a smallpox infested community at any time. The individual physician has not kept the faith; he has lost touch with his patients. At the same time he cries out against any other agency that is trying to put over health facts. It seems to me that it is a little bit of "dog in the manger." As a matter of fact when smallpox became epidemic in this county early in the year, a live school board in one of the districts conferred with me and asked if the school children could all be vaccinated. They had a very reliable and wise school nurse in this district, who had a wonderful faculty of getting cooperation from the students, parents and teachers. During two periods two hundred and eighty-seven children were vaccinated after this nurse had obtained the consent of the parents. Some parents were neutral and would not give their consent; others were opposed. Altogether thirty-one children in the school were not vaccinated; of these twelve took the disease and kept twenty of these students away from school. For this reason the school board felt justified in expelling all children who were not vaccinated. This edict brought forth vaccination of all but four. The mother of one believed that cream of tartar would prevent smallpox, giving as her authority an article written by a faddist, signing himself as a doctor and published in a Los Angeles paper. Now if this faddist could get his message of such a fool idea over, it seems to me that we could sell this vaccination one hundred per cent. Here is an example where a live school board, conferring with a physician practically enforced vaccination of an entire district.

The children themselves do not object to this; in fact the younger ones in the first and second grades crowd each other to be vaccinated first. It is a game with them and

they do not complain at all when the U. S. Public Health method is used.

When it comes to diphtheria the idea has not been sold as well in this community as in some others. I am now putting on a campaign to have all children between the ages of nine months and ten years, protected as far as possible from diphtheria. It is my experience that the younger the child is when vaccinated, the less the reaction and the more lasting the immunity. The teachers in the various schools have been more or less educated on the subject of health and they are, in general, more familiar with the health laws than the physicians who have not come in contact with them. It seems that the principals of the schools have familiarized themselves with what is best to be done during an epidemic and with the exclusion of sick children from the school. I am sure that we can get a great deal of cooperation from these various school boards and principals in putting over a campaign for immunizing against diphtheria. A great deal of the objection comes from more or less startling stories carried by word of mouth from old army days when some few of the recruits fainted while being vaccinated against typhoid and other things. I have tried to explain this by saying that it was a mental condition, but the fact is there and cannot be gainsaid that people are sometimes afraid of these things.

Now typhoid vaccine immunizes for from two to five years, with a general average of some immunity for three years, although the U. S. Army observers claim that full immunity lasts only one year. In typhoid, therefore, the question of immunizing the school children is rather a more serious problem than the others, as we canont say how long the immunity lasts and the economic aspect certainly becomes important to a great many people.

For two consecutive years before Boy Scouts were allowed to go on summer camp trips, immunization was demanded, with a falling off of the numbers who were willing to go through this procedure before going to camp, and for two more years this was an elective procedure with very few asking for it and now nothing is said about it. You can see that if boys or their parents are not willing to let a selective class of them be vaccinated before going away on a wonderful trip, how much education will be needed in order to sell this idea generally among school children. I believe, as physicians, we should use all of the agencies necessary to educate the public to this immunization. The school nurses, the Parent-Teachers Association, the teachers, principals and school boards, as well as women's clubs and other agencies interested in children. You would be surprised to hear the intelligent papers on these subjects at women's club meetings. We may differ with them as medical men on procedure, but the chairman of the Public Welfare Department of the Women's Club showed me that the Federation of Women's Clubs of Arizona was very much alive to health problems and immunization,—even discussing these things without the promptings of medical men.

But let us not be amiss in our education of the public. I still believe that part of the function of the family physician is to sell health to his people and if we fail to do this some other agency, some quack, will sell his idea, to the detriment of medicine, and when he does so we complain that he is not only treating the public unfairly, but is taking away part of the physician's revenue.

The State Health Department is not trying to foist anything upon the public at the expense of the physician; it is adding, if possible, to the prestige and income of the physician by advocating these measures which mean health.

At the present time we have four communities in Arizona with typhoid epidemics and it is a good time to sell immunization against typhoid. It is my own idea that if immunization of children against diphtheria were carried on in North America for one generation, the disease would disappear from the category of diseases, provided our ports of entry functioned properly. This would be a wonderful advance, seeing that only thirty years ago diphtheria was perhaps the most dreaded disease of children.

VENEREAL DISEASE AMONG THE NAVAHOS

R. H. POUSMA, M. D.,
(Superintendent Rehoboth Mission Hospital)
Rehoboth, N. M.

I have heard the remark made a number of times by physicians who ought to know better, that there was practically no venereal disease among the Navahos, the greatest tribe of Indians in the United States. Nothing could be farther from the truth, and the only way I can explain such statements is that these physicians either have not come into extensive contact with adult Navahos, or that they have not gone to the trouble of giving them thorough physical examinations, including blood tests.

I am not in a position to give exact figures on the number of cases of gonorrhea and chancroid that have come to my attention during the past two years in caring for this people, although I may say that they have been frequent and included almost ev-

ery aspect of these diseases. Syphilis is alarmingly frequent among them, and to substantiate that statement I would like to present the following figures.

Let me say first of all that we have made it a rule in our hospital to have a Wassermann made on every adult Navaho entering our institution as a patient. The specimens are sent to the New Mexico State Laboratory at Albuquerque, where both a Wassermann and Kahn test are made on each sample of blood sent.

In a series of 356 cases, fifty-one tested four plus positive, three were three plus, two were two plus, nine one plus, and 290 were negative to Wassermann test. In other words, the blood of over 15.7 per cent, or more than one in every seven adult Navahos coming to our hospital for treatment, reacts positively to the Wassermann test. These figures are all the more significant when one bears in mind that only a small percentage of the patients come to us with complaints directly attributable to syphilis. It was only by making a routine test on all adult in-patients that this state of affairs was brought to light.

A very distressing feature of the situation is the fact that these people, without exception, refuse to take a full course of treatment to cure them of their syphilis. They will take two or three injections of neosalvarsan, and that is all. A Navaho can see no sense in having his arm punctured each week, or in fact, in receiving any kind of medical treatment, when he is feeling subjectively well. This disinclination is very much strengthened by the fact that he is frequently compelled to travel from twenty to forty miles to receive his treatment, and that he usually has no better means of conveyance than an undernourished pony.

Still, something surely ought to be done to check the spread of both syphilis and gonorrhea among the Navahos. It appears to me that the Indian Bureau of our government should do the needful in this matter. The Indians are the wards of our government. The government gives them paternal care and assumes paternal authority over them. Under the circumstances, the counties and states regard the Indian largely as outsiders and give them scanty attention. Charitable institutions such as ours spend many thousands of dollars each year in their care, but we can only do as much as will be accepted voluntarily. We do not have the power of compulsion, such as is possessed by our government officials.

What then can be done, not only to heal the venereally sick, but, and that is of far greater importance, to prevent those that are well from becoming infected?

In the first place, the Navaho should be instructed as to the nature and dangers of the three types of venereal disease. It is my experience that most Navahos with whom I have talked about these matters have a dreadfully inadequate idea regarding gonorrhea, and never conceived of such a systemic venereal disease as syphilis. Certainly they ought to know more about these scourges. The knowledge may not prevent them from indulging in sexual indiscretions with resulting infections, but if we have properly warned them, we shall at least have cleared our own consciences.

The primary place for this instruction is in the schools. There practically all of the younger generation of Indians can be reached. It is true that most doctors are loath to address the pupils on this subject, and only a few have the ability to do so with lucidity and propriety; but surely our government officials can find some doctors among its hundreds who have special ability along this line and who could spend a day or two each year at the various government Indian schools to give this instruction.

Other opportunities are presented by the frequent meetings our government agents have with groups of Indians. A physician could occasionally be taken along to give those assembled an earnest talk on the threat of venereal disease to the welfare of the tribe. The Navahos do not take offense at such an address. They listen with real appreciation.

Another means of combating the spread of venereal disease among the Indians is to compel the patients suffering from it to continue receiving treatments until they are pronounced cured. The government can do this with its wards just as effectively as army officers do it with enlisted men. Owing to the distances the Navahos live from the hospitals we can hardly expect them to come for regular treatment voluntarily with their own conveyance, and it wuold be almost a hopeless task to send out a policeman with an auto to get them each time. But what can be done is to hospitalize these patients, under compulsion if necessary, until they are well, even if it takes several months. They will be ambulant patients and the expense of caring for them can be reduced by compelling them to do manual labor around the place. That would be a rigorous measure, but it seems to me absolutely necessary if the present frequent infections are going to be checked.

Finally, I would suggest that when a patient comes to us with a venereal disease, we

make an earnest effort to learn from whom it was contracted. This is not an impossible task, as I have learned by experience, and sometimes the revelations are startling. The party from whom the disease has been acquired should then be apprehended and compelled to undergo hospitalization until a cure is declared. The importance of such action was stamped indelibly on my mind last winter when two young men came to me for treatment. They came from widely different localities on the reservation, but both presented the same symptoms, badly swollen organs, dripping with pus. Without much ado they told me the names and addresses of the women from whom they had received the infection. Both said that at least a dozen more young men had been infected by each woman, but that those boys were trusting to the incantations of their medicine men t oheal them. Meanwhile the women were continuing to receive all comers.

It is true that among us pale faces the incidence of venereal disease is also alarmingly large, and that apparently little can be done about it. But certainly something can and ought to be done about the matter for the reservation Indians. They are the children of our government and ought to be protected against the ravages of these dreadful disease, t owhich they are ignorantly exposing themselves.

FRACTURES OF THE PELVIS

E. J. CUMMINS, M.D.,
El Paso, Texas.

Five cases of fracture of the pelvis form the basis of this paper. It is presented to show how common the fracture is, and how easily it may be produced and the good results obtained in the majority of the cases.

Text books, as a rule, do not mention automobiles as a cause of fractures of the pelvis, but three of these cases were in automobile accidents. Another was riding a motorcycle and had a collision with a truck. The fifth was crushed between two street cars.

CASE 1.—While riding in an automobile, sitting between the driver and another young man, the driver swerved to avoid striking a child and struck a telegraph pole. None of the passengers were thrown from the car. On getting out of the car patient found she was unable to stand. She entered hospital March 12, 1927, complaining of pain in the pelvis and inability to stand alone. Examination revealed localized tenderness over the right pubic bone and bilateral pressure caused pain. There were some blood cells in the urine. X-ray showed right pubic bone fractured near its junction with acetabulum and displaced downward, also fracture at the junction of the right pubic bone and ischium. Right ischium fractured at the mid portion. There was a line thru left pubic bone near its junction with the acetabulum. Patient was kept in bed on a Bradford frame with legs and thighs flexed for a period of about six weeks. She made a good recovery and has no complaint to make.

CASE 2.—School girl sitting on the back seat of an automobile was thrown forward against the back of the front seat when her car was struck by another car. She does not remember any great pain, but was unable to stand. She entered hospital Jan. 19, 1927. Examination revealed tenderness over the lower abdomen and pressure on the pelvic bones caused pain. Any attempt to move the lower limbs caused pain. The symphysis was separated. The urine contained large amount of blood. X-ray revealed oblique fracture of the left pubic bone at its junction with acetabulum, also at its junction with the ischium. The left ischium fractured at its midportion. The right pubic bone just anterior to the acetabulum was also fractured. Two attempts were made to reduce the fracture with only partial success. The following day patient was operated, fracture reduced, and the pubic bones wired together. She was in the hospital on a Bradford frame from Jan. 19th. to Feb. 9th. The wire was removed some weeks later because of a persistent discharge from the wound. She has made a most satisfactory recovery.

CASE 3.—Young man sitting in front seat with driver when accident occurred. Occupants of rear seat were thrown against him. He was not thrown frmo the car. He could stand, but could not walk when brought to the hospital Aug. 9, 1928. Examination revealed tenderness on pressure over pelvic bones. Symphysis seemed to be separated. Bruised areas over upper third of right thigh, as if he had been struck by something. Movement of lower extremities caused pain. Urine did not contain any blood. X-ray revealed right pubic bone torn free from the aoestbulum and its attachments to the ischium. Attempts to reduce the fracture were unsuccessful and patient was operated, fracture reduced, symphysis wired. A very satisfactory result obtained. Patient was in hospital from Aug. 8 to Aug 25, 1928. Wire was later removed.

CASE 4.—Patient was caught between two moving street cars, rendered semi-unconscious and entered hospital Feb. 21, 1928. On the examination table he was groaning and complaining of pain in his left chest, pelvis and right leg. There was crepitation of fractured ribs on the left side, and subcutaneous emphysema. The lower left chest was dull to percussion. Abdomen rigid, marked tenderness over left quadrant. Pain was present when pressure was applied to the pelvis and increased when the right lower limb was moved. Urine showed a large amount of blood present. X-ray picture showed fractures of the left 6, 7. 8, 9 and 10 ribs. Partial collapse of the left lung with fluid in pleural cavity. The right acetabulum was driven in. The patient was in terrific shock and for several days it appeared as if he would not recover, but he gradually gained and left the hospital one week later. He shows considerable deformity. The right side of his pelvis is rotated outward, the trochanter is nearer the medium line than the left. The distance from the anterior superior iliac spine to the internal malleolus on the right side is less than on the left. There is some wasting of the right limb. He has a slight limp. Flexion of the thigh is somewhat limited. He is fortunate to be alive.

CASE 5.—This young man was riding a motorcycle when he had a collision with a truck. He entered hospital Sept. 29, 1928. complaining of severe pain in his back and down his thighs. He wanted to lie on his stomach. He was able to move his lower extremeties but movement caused pain.

Pressure on pelvis revealed abnormal mobility of right illum. X-ray revealed the right pelvic bone torn free from its attachment to the acetabulum. The right ischium was fractured at its anterior half. The right sacro-iliac joint was partially limited. The patient lived a few hours and a partial autopsy revealed a lacerated external iliac vein with a profuse hemorrhage retroperitoneally. Kidneys and bladder were not injured.

REPORT OF FOUR BRONCHOSCOPIC CASES

W. E. VANDEVERE, M. D.,
El Paso, Texas.

(Read at the meeting of the El Paso County Medical Society, Sept. 23, 1929.)

During the summer months I have had four interesting cases of foreign bodies in the air and food passages. The youngest of these cases was two and one-half years and the oldest was seventyty-five. Two were foreign bodies of the esophagus and two of the right bronchus.

The first case, June 4, 1929, Mrs. C. G., Mexican, 75 years of age, stated that three days previously while eating chicken soup, something lodged in her throat and since that time she had been unable to swallow food and even water produced great pain when she attempted to swallow it. Fluoroscopic studies showed a mass obstructing the esophagus at the aortic constriction anterior to the fourth thoracic vertebra. On passage of the esophagoscope the breast bone of a chicken was found lying horizontal in the esophagus and tightly wedged into the overhanging mucous membrane on each side. After some manipulations the bone was loosened and removed.

The second case, July 5, 1929, F. C., three-year-old American girl was brought to me, with the history that the previous day she had swallowed a glass bead. There had been no severe coughing spells nor embarrassment of respiration, and no trougle with swallowing her food. Her only trouble seemed to be a rather wheezy, asthmatic type of respiration with occasional dry cough. She had never had asthma or that type of respiration previously. X-ray picture showed a glass bead about 6 mm. by 10 mm. in the right bronchus. Difficulty was encountered in grasping the tightly wedged bead with the ordinary alligator type of forceps, but by using a flat type of forceps room was found to pass the blades on each side past the center of the bead and in that way a firm grasp was secured and the bead easily removed.

The third case: August 15th, M. B., three-year-old American boy from Santa Rita. The parents stated that he had swallowed a nickel that morning, and since then had been unable to swallow solid foods, and had complained of pain in his chest. X-ray showed a coin lodged in the esophagus at the aortic constriction opposite the fourth thoracic vertebra. The nickel was easily removed through the esophagoscope.

The fourth case, August 19th. S. R., with two and a half-year-old Mexican girl from La Union, N. Mex. The parents stated that two days previously the child was eating watermelon and had a severe coughing and strangling spell, and since that time had been coughing a great deal. The child was brought to El Paso that same day and an effort made to locate a foreign body with x-ray, which failed. The parents were told to return if the baby did not get all right. I saw the child for the first time two days later. The cough and dyspnea had gotten worse instead of getting better. There was a loud wheeze heard all over the chest. Knowing that an x-ray picture would not reveal such a non-opaque body as a watermelon seed, and remembering having seen a child in New Orleans killed by a watermelon seed being coughed up from a bronchus into the larynx where it cut off respiration, I lost no time in taking the child to the hospital, where I removed a watermelon seed from the right bronchus.

All of these cases were taken care of under general anesthetic. Where one has a trained corps of assistants doing several of these cases each day, local or no anesthetic is probably better.

Metallic foreign bodies throw a dense shadow on x-ray films. Glass also throws a good shadow because of the lead contained in glass. Organic bodies such as beans, peas, peanuts and watermelon seeds do not, as a rule, throw shadows sufficient for recognition. When we get a complete plugging of a brunchus by such a body we may get at first a distended, emphysematous lung and later a water logged or atelectatic condition.

Each of the four cases enumerated made an uneventful recovery and was allowed to leave the hospital the following day.

THE ICE PACK OR COLLAR CONTRAINDICATED FOLLOWING TONSILLECTOMY.

F. L. REESE, M. D., Phoenix, Ariz.

Two years ago I was struck with a peculiar fact relative to my tonsillectomies. I found, for some unknown reason, that the cases operated on at the various hospitals were subject to post-operative bleeding, while such bleeding was much less prominent or practically absent in the cases operated in the office and sent to their respective homes. This held good in tonsillectomies done under both local and general anesthesia. I gave considerable thought to possible reasons for this seemingly paradoxical condition. One fact struck me with particular significance: that the patients operated on at the hospitals would have their necks immediately enclosed in an ice container, whereas the office cases received no such medication. I gave orders that none of my tonsillectomy cases was to have an ice pack applied to the throat following operation, and this rule has been adhered to in the last two hundred and fifty tonsillectomies. In this number, there has been one post-operative hemorrhage of minor consequence.

I am firmly convinced, in spite of all teaching to the contrary from the time the first tonsillectomy was ever performed, that the ice pack is not only of no value, but is a positive menace. I have hesitated for some time to publish such a view, realizing that it is

contrary to universal conception. I am making no pretense at analyzing the physiological principles underlying it. I believe it is generally recognized that the application of cold causes a primary contraction of the arterioles, and this is followed by secondary paralysis and relaxation. This may or may not be an important factor. On the other hand, from a purely theoretical standpoint, it is possible that the contraction of the superficial arterioles of the skin induces a compensatory dilatation of the deeper vessels with which we are primarily concerned. If this method of treatment is sufficiently followed by our otolaryngologists, the truth of these deductions will be readily proven and the ice collar will be relegated to the realms of antiquity.

CASE REPORT

VINCENT'S ANGINA INFECTION OF VAGINA; NEURORETINITIS; BLINDNESS; CURE.

ORVILLE HARRY BROWN, M.D., Ph.D. and
LOREN C. BARLOW, M.D.,
Phoenix, Arizona.

The mother first reported that her daughter, five years of age, had a slight vaginal discharge. This proved to be Vincent's infection. The mother was given perborate of soda solutions to inject into the vagina. After two to three weeks treatment by the mother, with no improvement, the little girl was brought to the office for treatments.

The vagina was small, barely admitting a small applicator with cotton. At times the applicator would go to no greater depth than an inch to an inch and a half; at other times it would apparently slip by an obstruction and go a considerably greater depth. Small polypi, two or three in number, with the applicator. The agents used for local perhaps a fourth of an inch in diameter with pedunicles, were occasionally withdrawn from the vagina applications in the vagina varied, but for most part consisted of perborate of soda, mercurochrome and silver nitrate.

During the course of the treatment, which lasted for more than two months, the mother commented that the neighbors had remarked that her daughter's eyes had an abnormal appearance; a casual examination discovered nothing definitely wrong at the time. A few days later the mother again spoke of the eyes and said she was beginning to doubt that the child could see.

Dr. W. A. Schwartz was asked to see the patient. He reported that there was a severe grade of neuroretinitis with capillary hemorrhages in both eyes, with little or no vision; that if the eyesight was to be saved something must be done at once; and that he doubted that treatment could bring back the vision.

Blood and spinal fluid Wassermann tests were done, not only on the child but upon both parents; all were negative. Other spinal fluid tests for syphilis were negative.

Just as a decision was reached to give a course of neoarsphenamine varicella developed. This delayed treatment for two weeks. Three tenths of a gram of neoarsphenamine was given intravenously. Slight improvement was noticed within a few days. Second and third injections of neoarsphenamine were given with definite benefit following each; then, on account of the difficulty of getting into the veins, thio-bismol was given intramuscularly. She was also given mercurial rubs. The treatment was intensive. Recovery has been complete as far as the eyes are concerned.

The vaginal discharge still continued, but less in quantity. Vaginal treatments were not omitted; during a treatment a lipstick holder was accidentally discovered within the small vagina; extraction of this has given the vaginitis a chance to get well.

The Vincent's organisms were not found after the first two or three weeks of treatment.

Conclusions: The fact that the arsenical, bismuth and mercurial preparations effected a cure suggests that the spirochetae were the causative factor back of the retinitis.

The vaginal infection and the lipstick in the vagina shows the importance of teaching parents to have close constant supervision of their daughters.

RECURRENT HEMIPLEGIA IN A YOUNG MAN

Diagnostic Discussions and Autopsy Report

Case History

An American engineer thirty-six years old entered July 26.

At fourteen he had an attack of rheumatic fever with apparently complete recovery. After it his tonsils were removed. He had never had another attack, or chorea. He felt perfectly well, lived a life of normal activity and played tennis and golf with no bad effects. During the war however he was rejected by both the Canadian and American armies. Five years before admission after an evening of bowling he had epigastric pain lasting twenty-four hours, not relieved by soda. At this time he had very transient right-sided paralysis and was mentally confused for a few minutes. After nine months of rest and medical treatment he was able to work again, continuing treatment. Six months later he fell, had severe pain on the right side of the head, and paralysis of the left side of the body. He had aphasia for a long time, and since that time had never been able to think and speak quite so rapidly. The paralysis cleared up in time. He gave up work. A year later, three years before admission, he had a third attack of the same sort affecting the left side, again clearing up. Twenty months before admission he had two milder attacks within a month. After each of these attacks he rested in bed three weeks, then gradually got up and about again. Five weeks before admission he had his latest and worst attack, with left sided paralysis. During the last four attacks he had partial loss of sphincter control. Most of the symptoms cleared up after the last attack, but he did not regain strength or complete sphincter control. He was very nervous and slept fitfully. Until this week he had never had more than very slight dyspnea. For the past forty-eight hours he had been increasingly weak and dyspneic.

He had had hospital treatment for cholecystitis and influenza, as well as for his chief illness. He had many abscessed teeth. For four years he had had gall- stone attacks—severe colicky pain in the right upper quadrant with jaundice and pruritus. X-ray showed the gall-bladder to be full of stones. The last attack was a year before admission.

His father was said to have a "leaky valve," though he seemed well.

Clinical examination showed a very sick looking, sallow, cyanotic man propped up in bed in moderate respiratory distress. Sclerae slightly injected.

Apex impulse of the heart diffuse and heaving, the point of maximum intensity in the fifth and sixth spaces eleven to twelve centimeters from midsternum. Also impulse in the second space to the left of the sternum. Left border of dullness 12 plus centimeters to the left of midsternum, midclavicular line 7.5 centimeters, right border 4.5 centimeters, supracardiac dullness 5 centimeters. Sounds of fair quality. Rate 160. A systolic thrill at the apex. A systolic murmur and also a questionable diastolic at the apex. Pulmonic second sound accentuated. Radial pulse weak and irregular in volume and rate. Blood pressure 90/? to 120/80. Lung signs: Diminished breath sounds, whispered voice, tactile fremitus and rales right anterior; dullness and moist rales. Liver dullness 3 centimeters below the costal margin. A questionable edge felt at this point. Spastic paralysis and beginning contractures of the left arm. Increased tendon reflexes. Clonus and questionable Babinski on left leg. Tongue deviated slightly to the left. Left sided facial weakness. Pupils equal, pin point (morphia), slight reactions to light and distance.

Urine: amount recorded only once, then normal, specific gravity 1.030 at two examinations, a trace to a large trace of albumin at both, occasional leukocytes at both, two red cells once. Blood: 15,500 leukocytes, 83 per cent polymorphonuclears, hemoglobin 70 per cent, reds 4,900,000. Smear normal. Hinton not recorded.

Temperature 98° to 107°; steady general rise with morning drop. Pulse 64 to 165 with deficit of 12 to 36 beats. Respirations 17 to 38.

The patient continued in an extremely ctitical condition. The morning after admission the apex beat was 160 to 180. By evening the rate was 108. He was incontinent and irrational. He grew weaker. July 28 the left chest was full of rales and there were rales at the right base. He had no bowel movement, but the abdomen was perfectly soft. July 30 he died.

The following are the discussions of this case by Group 1, of the Yavapai County Medical Society and Medical Officers of Fort Whipple:

DR. JOHN W. FLINN

There seem to be two distinct angles to this case. One points to the brain; the other draws our attention to the heart. The presenting symptom is a series of paralyses indicating a gross lesion in the central nervous system. Prominent physical signs point toward cardiac pathology.

In attempting to correlate these different signs and symptoms into a picture of a definite disease entity, Group I will begin with a study of the signs in the region of the heart. Before attempting to interpret these physical findings, let us not forget that this heart is in the last stages of broken compensation. The heart is enlarged, almost surely dilated. A very fast pulse rate and other signs indicate broken compensation. Almost surely this heart is leaking at every valvular opening. It behooves us, therefore, in the light of this, to be very careful how we interpret signs, either in their absence or in their presence.

The history of rheumatism and the fact that the physical signs are practically all centered around the apex of the heart, lead us to conclude that we have here a lesion in the mitral area. On the other hand, a negative or rather lack of a positive, Wassermann, and lack of physical signs in the base of the heart point away from any lesion in the aortic region.

I will not go over these physical signs in detail but will say that so far as the opinion of Group I is concerned, the only outstanding physical sign to which we are paying much attention is a doubtful diastolic murmur at the apex. In our opinion the systolic murmur at the apex in itself means practically nothing. The systolic thrill we interpret as indicating a lack of free passage of blood through the pulmonary artery. If this diastolic murmur is present we would expect it to be faint and not easily heard. If the diastolic murmur is present, with the impulse in the second space to the left of the sternum, with an accentuated pulmonic second sound and with considerable enlargement over the area of the left auricle, we think it would justify us in making a tentative diagnosis at least of mitral stenosis.

McKenzie tells us that the diastolic murmur in mitral stenosis is confined to the region around the apex, as would be the case here. In our opinion mitral stenosis will account for the physical signs present and for the condition of the heart in all respects except one, and that is enlargement of the left ventricle. Mitral stenosis, you will remember, will not cause enlargement of the left ventricle. This enlargement, with the systolic murmur, we consider sufficient to justify us in thinking that there is also a mitral incompetency, complicating the stenosis. It is our opinion that if this heart had been examined some time previously, before compensation was broken, a diastolic thrill would have been felt at the apex, and probably also either a pre-systolic or diastolic murmur would have been heard over the region of the apex. Possibly these were the physical findings that prevented this man being accepted for military service.

Having made a tentative diagnosis of mitral stenosis, we next ask ourselves the question, what pathology will probably be found in this heart at post mortem? What will probably be found is, quite intense fibrosis and sclerosis in the ring, in the valve, segments and also in the cordae tendinae.

So far as the mitral opening itself is concerned, it may be funnel shaped or slit-like. A pathological condition in the mitral opening will cause considerable enlargement of the left auricle. This, in turn, will lead to passive congestion of the lungs and considerable enlargement of the right ventricle. The left ventricle, if enlarged, as we think it is, will be the result of an incompetent valve.

But, unfortunately, this pathology is not confined to the valves or the ring. In a large proportion of cases fibrosis extends to the heart muscle and it is then that we get decompensation and eventually dilatation. In extending from the valvular region to the heart muscle it encounters that specialized form of muscle by which the impulse of the heart to contract is carried. You will remember that there are two chief nodes concerned in the conduction of this impulse to contraction. The first one is the sino-auricular node; the impulses are conveyed from this through the muscles of the auricle and eventually enter in the auriculo-ventricular node. From the auriculo-ventricular node we get the bundle of His, which divides, a branch coming to each ventricle. These bundles of His are the only muscular connection between the auricles and the ventricles. Taking this into consideration, do not forget that the mitral opening and the mitral valve are situated very close to the auriculo-ventricular bundle. Fibrosis affecting this specialized form of muscle gives rise to the various irregularities about which so much has been written.

Cardiologists tell us that the particular form of disturbance of cardiac rhythm most often associated with mitral stenosis, is auricular fibrillation. In

the statistics of Thomas Lewis it is brought out that in fifty per cent of all cases of mitral stenosis, the auricles fibrillate. and that in more than fifty per cent of all cases of fibrillation, mitral stenosis is present.

What is the effect of auricular fibrillation? The effect is that the auricle is in a state of diastole; that systole of the auricle nerve occurs so long as the auricle is fibrillating. The consequence of this is that by reason of the quivering motion of the muscles of the auricle. a churning of the stagnated blood in the auricle takes place and emboli are very apt to occur. So long as the auricle continues to fibrillate these emboli do little or no harm, but once the auricle goes back to its normal rhythm and systole of the auricle takes place, some of these emboli are apt to be forced through the narrow, stenosed opening and carried into the general blood stream, perhaps to the brain, to the intestinal tract, to the kidneys, or to any part of the body, and set up embolism and infarction.

So far as the heart condition is concerned, the diagnosis of Group I is mitral stenosis with an accompanying mitral incompetency, the mitral stenosis leading to auricular fibrillation and thrombosis in the left auricle, with emboli to different parts of the body.

DR. CLARK B. DEVINE

My colleague has just given you the cardiac aspect of this case and we will attempt to present the hemiplegic point of view.

In the last five years of his life this man had some six attacks of hemiplegia. Some of them were severe and some light. The first was light and involved the right side of the body. The second and last were severe and involved the left side of the body.

Hemiplegia is not a disease but a symptom complex. It occurs whenever there is a lesion of the pyramidal tracts as they pass through the brain. As far as hemiplegia itself is concerned, it makes little difference whether the lesion is in the cortex, in the tissues immediately below the cortex, the internal capsule, the mid brain or the brain stem. There are usually other accompanying symptoms by which the position of the lesion may be more accurately located.

The causes of hemiplegia are many. The most frequent cause is rupture of a blood vessel and hemorrhage into the brain substance, which usually occurs in sclerotic arteries in old people. Our patient, when he began to have his attacks of hemiplegia, was thirty-one years of age, so that this type could probably be ruled out. The second most frequent cause is probably embolism and this type we believe our patient had. You have heard described the formation of the embolus in the auricle, passing down into the left ventricle, out through the aorta and up through the internal cartoid, through the circle of Willis to the middle cerebral artery and on to the sylvian arteries. The sylvian are end arteries and collateral circulation would be established with difficulty, if at all. A lesion here will produce marked symptoms. The third cause is thrombosis that may occur from pieces of vegetation being thrown off by diseased valves of the heart, stopping some place in the brain and clot forming afterwards. Then also there is syphilitic endoarteritis as a cause. There are no symptoms of syphilis mentioned, however, so we must pass on. Other causes of hemiplegia might be tumor or foreign body such as bullet, or abscess, infection, which sometimes occur in mitral stenosis. Bacteria in pure culture sometimes are thrown off from valves and lodge in the brain, forming abscess. But this case covers too long a period for abscess.

To locate the lesion a little better, we have seen that as far as hemiplegia is concerned it may be almost anywhere in the brain. We need some other symptoms and probably the only thing given us is the aphasia. The history states he had a little aphasia after the first attack and it immediately cleared up. With the second attack the aphasia was more severe and he never thought so rapidly or well afterwards. Broca in his classical description of aphasia located the lesion in the third frontal convolution on the left. Marie disputed that theory and gave some very good dissections proving his statement. His conclusions were concurred in by Head, the great English neurologist. Marie locates the speech center as bounded on the outside by the cortex, medially by the internal capsule and lateral subtending the space occupied by the island of Reil in the left side of the brain. This patient had a left sided hemiplegia which presupposes a lesion in the right side of the brain. To conform this to our case we suppose this might be due to the fact that this man is left handed. In left handed people it is said that the speech center is apt to be on the right side of the brain. If he were right handed there would have to be two lesions, one in the internal capsule on the right side to account for his left sided hemiplegia, and the other in this area that is described by Marie on the other side. Although there sometimes occurs the re-education of the individual and the area on the right side takes over the function that was formerly taken care of by the left. This may have occurred in this case because we note that first he did have a right sided hemiplegia. The history says he recovered and in about nine months was pretty nearly himself again. There might have been time for re-education and development on the other side. This is perhaps a little far-fetched. He was either left-handed or there were two lesions.

The history mentions a spastic paralysis and contracture of the left arm and Babinski on the left. These things are simply the symptoms of an upper motor neuron lesion and due to hypertonicity produced by this lesion.

DR. GAIL D. ALLEE

Our case for discussion is that of a man who dies at thirty-six. A man who had rheumatism at the age of fourteen, who enjoys life and indulges in all ordinary sports until thirty, when he had an attack of hemiplegia and aphasia. For the next five years, from his thirtieth to thirty-fifth year, he has a history of six attacks of hemiplegia and is brought into the hospital a very sick man, suffering with severe dyspnea. Physical examination shows a very large heart, systolic thrill and questionable diastolic murmur. He has some albumin in the urine, very high temperature up to 107; leukocytosis 15,000; some dullness in base of right lung; rales in both lungs. The history and findings indicate an organic heart lesion. Ninety per cent of heart lesions are due to three causes—hypertension, syphilis or rheumatism. This man is entirely too young for hypertension. There are no signs of syphilis and his Wassermann was negative. Moreover, a syphilitic heart lesion is generally a disease of middle age. It would be fairly safe to call this a rheumatic heart. We are safe in assuming that the mitral valve was affected and that he had a mitral stenosis, which is the most common rheumatic heart lesion.

We are told that this man got along very nicely from fourteen to thirty and is found bowling at the time of his first attack. Bowling is quite stren-

uous exercise and taxes the heart. He must have had a pretty good heart up to that time. It is our theory that his auricles were either due to fibrillate or were caused to fibrillate by his exertion incident to bowling. We think that his fibrillation caused formation of a thrombus, from which emboli were thrown off and dispersed through the blood stream. Had this embolus been a vegetation from the valve, he would have shown some period of ill health just prior to his attack and would not have been bowling. Vegetations are not given off after first attack. Exacerbations of the endocarditis after the first attack soften the vegetations and cause them to be liberated into the blood stream. This case had the signs and symptoms of all heart cases who die a heart death and which are due to congestion. Congestion shows in the lung, in the rales that he has, shows up in the kidneys, in the albumin that is present in the urine, shows up in the liver which was 3 cm. below the costal margin. He runs true to form with his mitral stenosis.

We are interested in that very high temperature at the close of the picture. I think most cardiologists state that terminal fever in mitral stenosis is nearly always due to something within the heart itself, either endocarditis or thrombosis. We are tempted to predict pneumonia, but that is not necessary as an explanation because the other conditions can account for the high temperature. We prefer the simpler explanation, the lighting up of an old endocarditis, or perhaps the formation of an intracardiac thrombus.

After admission to the hospital his pulse rate is given at various times as 160 to 180, which clearly indicates to our group that that is a case of fibrillation. If fibrillation occurs, it occurs early. In other words, early or never. And the reverse is true; if it is found late it must have occurred early in the picture. This man had it after admission to the hospital; therefore, our previous assumption that he has had it frequently since his thirtieth year is undoubtedly correct. If he has had fibrillation, Dr. Flinn has explained very clearly and convincingly that it could account for all this man's signs and symptoms. including those of the central nervous system, which resulted in hemiplegia.

The diagnoses of our group are:
Mitral stenosis
Mitral insufficiency
Hypertropyy
Dilatation
Thrombus left auricle
Hemiplegia
Passive congestion lungs, liver, kidneys
Infarct, kidney.

The following diagnostic summaries were presented for this case by members of the Clinical Club of Phoenix:-

VICTOR RANDOLPH, M. D.

We have a man with left complete spastic hemiplegia who has previously had transient partial paralysis of the right side. Causes of hemiplegia may be divided into those of moderately rapid and of sudden onset and those of less usual cause, often gradual, such as cerebral tumor, abscess, meningitis, general paralysis of the insane and so forth.

The onset in this case was sudden. Were it not sudden, we might consider syphilitic endarteritis of the middle cerebral artery as a cause. Besides, there was more than one attack; if entertaining syphilis as a cause, we should have to assume that ineffective antiluetic treatment had been administered between attacks. There is no evidence of syphilis in the history or physical findings.

All the other causes of hemiplegia can be ruled out with the exception of embolism of the middle cerebral artery, which is a cause of sudden hemiplegia without premonitory symptoms referable to the nervous system.

In this case we have evidence of mitral stenosis. Rheumatic fever is commonly a precursor of rheumatic heart disease, which is almost synonymous with mitral disease; this, in turn, leads by repeated attacks to mitral stenosis. Some seventy-five to eighty per cent of children under eight years who have rheumatic fever receive some cardiac damage. The percentage decreases with age. This boy was fourteen when he had his attack. Later evidence of heart disease in this case was his rejection by two armies. Men who play golf and tennis are not rejected for any reason except heart disease.

The attack of pain five years before admission was probably cardiac in origin, though we know little about it. This and the later attacks required long periods of rest in bed for recovery, also a picture of some heart condition.

I believe we must decide that these various attacks were each caused by embolism which led to thrombosis and infarction in various areas of the central nervous system supplied by the middle cerebral artery and its branches: at first on the left side, and in the later attacks on the right side. The auditory, visual and speech memory centers of the cortex are supplied by these branches, so that repeated infarctions led to changes which produced not only hemiplegia but a condition of aphasia.

Diagnosis: Mitral stenosis with thrombus formation. Infarction of the right cerebral cortex and internal capsule. Infarcts of the kidneys. Chronic passive congestion of lungs, liver, kidneys, spleen. Terminal bronchopneumonia. Cholecystitis and cholelithiasis.

DR. FRANK J. MILLOY

This is a clinical picture of a rheumatic heart with decompensation. The attack suffered after the evening of bowling was an acute decompensation. The picture upon entrance to the hospital was that of a long standing decompensated heart with a beginning terminal pneumonia. Apparently the pneumonia was hypostatic at first but probably developed into a double bronchial type. The cause of death is what Dr. Cabot frequently refers to as acute congestive heart failure. The autopsy findings will probable be double pneumonia, double mithal lesion with vegetative endocarditis, and gall stones.

The cause of the hemiplegia is somewhat of a puzzle. There is scarcely any doubt but that it was due to brain softening which in turn would be caused either by a thrombosis or an embolism. Nothing is said in the notes about the Wassermann. It does state, however, that after the first breakdown, he took some form of medical treatment for nine months and continued for six months after going to work. The sudden onset of the first attack of paralysis which was right sided, coming on after the severe exertion of a night of bowling, in a young man who has a heart lesion, is very suspicious of a cerebral embolism. It states, however, that this first attack of paralysis was very transient. For that reason, this might be one of these transient hemiplegias which is vasomotor in origin. The subsequent attacks of hemiplegia were on the left side. However, this recurring condition might be explained by recurring showers of emboli. It would be easy to explain by a cerebral softening

due to a syphilitic thrombosis which would help also to explain the spastic paralysis and the sphincter disturbance which developed toward the end. It is a little difficult to determine the location of the cerebral lesion. It is probably not in the internal capsule as nothing is said of a disturbance with sensation. The aphasia and lower facial paralysis, in the absence of other cerebral nerve involvement and the recurring hemiplegia is probably best explained by a lesion in the region of the corpus collosum. With the history of the old endocarditis. the hemiplegia is probably caused by recurrent emboli. The post mortem will probably also show old and recent infarcts in the spleen and kidneys due to these showers of septic emboli.

FRED G. HOLMES, M. D.

For the sake of brevity the detailed history will not be reviewed.

Rheumatic fever evidently caused an endocarditis which became chronic and caused his rejection from the army. With the slowly advancing disease of the mitral valve, there were few symptoms until the transient hemiplegia on the right. There were either vegetations on the mitral valve, a fragment of which was wiped off, or a particle of a left auricular thrombus became freed and caused an embolus to the left side of the brain. As there was no aphasia on this attack and later hemiplegia involving the left side of body was associated with aphasia, I would conclude that most likely he was a left handed man with the speech center located on the right side.

The different emboli did more or less permanent damage with the resulting spastic paralysis on the left.

The heart condition was probably a mitral reirregularity and its very frequent occurrence in left auricle a times, although the type of irregularity is not mentioned but the high pulse rate with irregularit yand its very frequent occurrence in mitral stenosis make it probable. The weak radial pulse, irregular in volume and rate, would also be consistent with a mitral stenosis and auricular fibrillation. The general enlargement of the heart both to the right and left and downward shows a right and left sided hypertrophy and dilatation. The dyspnea and rales at the bases of the lungs indicate a failing left heart and the slight fluid in the right chest and the enlarged liver show a failing right heart. The pulsating point to the left of the sternum is probably the conus arteriosus, dilated along with the rest of the general cardiac dilatation.

The terminal picture was undoubtedly that of a pneumonia with the high temperature, high leucocyte count, lung findings, etc.

Syphilis should be considered in this case, but believe the picture can be adequately explained by other conditions.

Diagnosis: Endocarditis, the mitral valve apparently standing the chief insult where there was a likely regurgitation and stenosis. Fibrillating auricle also probable. Decompensated heart. Spastic paralysis due to emboli. Terminal pneumonia.

ORVILLE H. BROWN, M. D.

The salient points in this history are: rheumatic fever at 14; shortly thereafter tonsillectomy; rejected at 23 by both the Canadian and American armies; at 31 years of age severe epigastric pain following physical exertion, with transitory right-sided paralysis and mental confusion; nine months treatment necessary to put him in physical condition for work; at 32 sudden severe pain on right side of head with paralysis of left side of body, and confusion on thinking and speaking; at 33 another and similar attack affecting about same area as before; at 34 two mild similar attacks; at 36, a few weeks before death, another attack of paralysis following sudden severe pain in the head.

In the last four attacks sphincter control was lost. He had had slight dyspnea at times; recently the dyspnea was severe. He had had hospital treatment. He had many abscessed teeth. The gall bladder was full of stones. The outstanding points of the examination were that there was cyanosis, difficult respiration, a diffused apex beat in the 6th interspace, 12 cm. from midline, right margin was 4½ cm. from midline. The pulse was as high as 160. There was a systolic thrill at the apex and a systolic murmur and a questionable diastolic murmur. There was moisture in the lungs. The liver dullness was increased. There was spastic paralysis and contractures of the left arm, increased reflexes, clonuses and a Babinski. The tongue deviated to the left and there was left sided facial weakness.

The conclusions which seem warranted from a study of this case are that early in life, before the age of 14, tonsillitis had developed; and from this there came rheumatic infection which affected the heart. It probably produced a vegatative endocarditis from which emboli were dislodged. They lodged at various places in the bodp but more commonly in the brain. Before the final illness he had cardiac decompensation with enlarged liver. Though there was no edema of the feet mentioned, it was probably present. As the result of brain emboli he had spastic paralysis, increased reflexes, clonuses and contractures. The presence of the systolic thrill at the apex accompanied with a systolic and diastolic murmur heard best at the apex suggest that the mitral valve was the one most seriously affected. Cardiac dilation probably had been a chronic condition. The lung changes were secondary to the decompensation and consisted of passive and hypostatic congestion with terminal pneumonia.

Syphilis must be considered as a possible etiological factor in this condition. But in the absence of a history and Wassermann to suggest syphilis, and since the picture seems to be explained on other grounds, syphilis, it seems, must be left out of the picture.

Following is the discussion of this case at the Massachusetts General Hospital (New Eng. Med. Jour., Jan. 24, 1929).

DR. RICHARD C. CABOT

NOTES ON THE HISTORY

The early lines of this history are of some interest because they are characteristic of what we see many times in this and in other hospitals. When people have an attack of rheumatism they ordinarily have another. But often if their tonsils are taken out they won't. If all the damage that is going to be done to the heart is done in the first attack we shall not accomplish anything by taking out the tonsils. But since it seems to be true that successive attacks of rheumatism have the effect of increasing the lesions on the valves, it is well worth while to take out tonsils after a person has had one attack of rheumatism as this patient had.

These transient paralyses, paralyses that entirely recover, are more often seen in rheumatic heart disease than in any other condition. When an old man gets a hemiplegia either it is permanent or it leaves some part of its paralysis behind. On

the other hand, when a yaung man, as a complication of such a disease as this, gets a paralysis, he ordinarily recovers wholly. The reason is, in the old man we have bad brain arteries; in the young rheumatic we have young arteries which are capable of supporting the circulation.

The second seizure was probably another attack of the same kind, and his fall was due to his losing consciousness. The aphasia is somewhat surprising, unless he was left handed. Ordinarily the speech center is on the left side of the brain and corresponds to a right-sided paralysis. This was a left-sided paralysis.

I do not remember any case of rheumatic heart disease having so many attacks of paralysis as this. I take it we have t osuppose that in each attack a fragment of thrombus, presumably thrombus of the left auricle, breaks off and goes up into the brain. In other words, these are embolic hemiplegias each time. It will be interesting, if we have a post mortem brain examination here, to see if anything is shown of these lesions, whether the results of embolisms that happened several years before are still going to show after death.

We expect then rheumatic heart disease, which is ordinarily mitral stenosis.

NOTES ON THE PHYSICAL EXAMINATION

I suppose this impulse in the second left interspace means hypertrophy of the heart. I think we cannot say anything more. We see it in big hearts if the chest is thin. It is not likely, I think, to represent the left auricle, because the left auricle is placed so far back that unless it is very greatly distended it does not come into contact with the chest at all.

The thrill and murmurs are about what we expect with a mitral stenosis.

In the lungs there are evidences of dropsy. There is no evidence of nephritis I should say.

DIFFERENTIAL DIAGNOSIS

The physical signs here are of repeated hemiplegia, of passive congestion, and of a valvular heart lesion, all presumably parts of the same process, all due to the rheumatic endocarditis. We are prejudiced in favor of this being a mitral stenosis in view of the fact that rheumatic heart lesions show that much more often than anything else. A good many of them show besides the mitral lesion other valve lesions which we have not been able to detect during life. But I do not see any particular evidence here of an aortic lesion. The only murmur is at the apex. It is associated with a thrill. Nothing is said of its being heard at the aortic areas. Nothing is said of increased pulse pressure or Corrigan pulse; there is nothing to point to aortic stenosis,—no basal thrill or characteristic pulse. So I should say the evidence points to a mitral stenosis, as in our original guess.

I believe then that he has a mitral stenosis with a series of brain embolisms the last of which has been permanent and left him with a hemiplegia, with passive congestion of the lungs and liver and presumably everywhere else. Is that enough? We have this ascending temperature. It is quite a spectacular chart. We cannot tell much about the pulse on account of the pulse deficit. The temperature is going up all the time during the five days that he is here. There are three things we can say about that. (1) In the first place there is a brain lesion, acute or chronic, and acute brain lesions of any kind are liable to be accompanied by temperature without any other cause. Cerebral hemorrhages often show fever. So it may be that we can account for the fever that way. It could also be accounted for by bland aseptic infarcts, or (3), by some infection. What infections should we have in mind as possibilities? Acute endocarditis I should say first, because acute endocarditis superimposed on chronic is one of the commonest findings in cases of this sort. There might perfectly well be pneumonia, covered up by the rales and dullness which we took for congestion. Beyond that I cannot make any guess.

The things which we are relatively sure of are a rheumatic valve lesion, presumably mitral stenosis and its results,—clots in the left auricular appendage and embolism from there. The thing we are not sure of is the cause of this terminal temperature.

A Student: Is hydrothorax often one-sided?

Dr. Cabot: It is often predominant on one side, and usually on the right side. To explain this, various hypotheses are advanced, none satisfying to me. Here the predominance is left and not right. One of the things that sometimes accounts for that is pleural adhesions, making it impossible for any fluid to accumulate in the pleural cavity itself. That might be so here.

A Student: Do you think vegetative endocarditis would explain the whole thing, the rise in temperature as well as the central nervous system involvement?

Dr. Cabot: Ordinarily people with bacterial endocarditis have chills and talk about them. Then by the time a person has had vegetative endocarditis as long as this he should have had an anemia. I cannot rule it out, and I dare say there would be no way of deciding post mortem whether it was vegetative all along or only at the end. But certainly bland emboli can do all the brain mischief that we are told about in this case.

A Student: Could he have an arterial process starting young and producing hemiplegias?

Dr. Cabot: I think that is so improbable that we should not assume it. We have here a very probable cause for what exists. But arteriosclerosis in a young man is so rare that, on the doctrines of chances which we are obliged to follow, I should say no.

A Student: Would vegetative endocarditis last for five years?

Dr. Cabot: A good many cases lasting three years have been recorded. I do not believe the duration is enough to rule it out. I have seen myself a case where there was continuous fever for over two years.

A Student: What do you call the origin of the emboli?

Dr. Cabot: I suppose they broke off from an tracardiac thrombus. The commonest place for an intracardiac thrombus is the left auricular appendage.

A Student: Has he not auricular fibrillation with a rate of 160?

Dr. Cabot: Yes, I should say so. I believe there is auricular fibrillation. I did not mention that because it is not a thing we can verify post mortem.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Rheumatic heart disease.
Auricular fibrillation.
Mitral stenosis and regurgitation.
Aortic regurgitation.
Cerebral emboli.
Left hemiplegia.
Pneumonia?

DR. RICHARD C. CABOT'S DIAGNOSIS.

Thrombus in the left auricular appendage.
Rheumatic endocarditis, mitral stenosis.
Cerebral embolism.
Chronic passive congestion.
Acute endocarditis? Pneumonia?

DR. TRACY B. MALLORY
ANATOMIC DIAGNOSIS

1. Primary disease.
   Rheumatic endocarditis, mitral stenosis.
   Thrombus in the left auricular appendage.
   Arteriosclerosis of the smaller coronary vessels.
2. Secondary or terminal lesions.
   Bronchopneumonia.
   Chronic passive congestion.
   Cerebral softening—three areas.

I will read the description of the heart, which is very typical of a case of long-standing but not extremely severe mitral stenosis. The heart weighed 640 grams,—greatly enlarged and dilated. The apex reached four centimeters beyond the nipple line, the right border five centimeters to the right of the dent in the left auricle, which was approximately twice the size of all the other three cavities put together. Next to that the right ventricle, which was approximately twice the size of the left. Along the small superficial branches of the coronary arteries were numerous minute nodular swellings which were shown later by histological examination to be in part arteriosclerotic from thickening and calcification of the intima, in part also healed rheumatic nodules, that is Aschoff bodies, shown by fusiform fibrous tissue thickenings of the adventitia so old that the characteristic mononuclear cells have by this time largely disappeared. The wall of the right ventricle, in spite of dilatation, was one-half centimeter in thickness, the wall of the left ventricle approximately normal. The columnae carneae were greatly hypertrophied. In the tip of the auricular appendage of the left auricle was a thrombus. The mitral valve showed marked fibrous thickening and partial calcification of the cusps and surrounding ring. It was significantly narrowed but still admitted readily the tips of two fingers. The chordae tendineae were thickened but not much shortened, and the valve margins approximated closely, so very probably there was no important degree of regurgitation. There were no fresh vegetations and no endocardial lesions on the other valves.

The tricuspid valve measured 18 centimeters in diameter, a very unusual figure, and it is not impossible that there may have been a relative tricuspid insufficiency.

The other organs showed a uniformly high degree of passive congestion. There was a bronchopneumonia in the right base. The gall-stones which had been seen in the x-ray were present still in the gall-bladder. There were the scars of several ing of varying age, the freshest being in the right rather old infarcts in the kidneys.

The brain showed three separate areas of soften-lenticular nucleus, an earlier one in the optic thalamus, also on the right, and a still earlier one in the right occipital lobe.

A Student: What was the explanation of the epigastic pain of twenty-four hours? Did he have an infarct?

Dr. Cabot: He had gall-stones, and gall-stones can give epigastric as well as right-sided pain. I think the best explanation would be gall-stones.

A Student: What causes the embolism?

Dr. Mallory: An ordinary ante-mortem clot in the left auricular appendage.

A Student: What did the kidneys show?

Dr. Mallory: They were all right except for in-lower lobe.

A Student: What about the signs in the left chest?

Dr. Mallory: He had a small amount of fluid in each base, but his pneumonia was in the right liwer lobe.

Dr. Cabot: I suppose we shall never know the answer to the question as to the cause of that fever, because we have at least two causes either of which could produce it,—the bronchopneumonia and the infarct. I do not know whether anything in the brain was recent enough to have anything to do with that.

Dr. Mallory: The final one in the right ventricular nucleus was quite recent.

A Student: What was the degree of the bronchopneumonia?

Dr. Mallory: It was the major portion of the right lower lobe.

Dr. Cabot: My guess is that he would have lived for a long time if it had not been for that pneumonia, because he was not much worse off as to his heart than he had been several times before.

ARIZONA NEWS ITEMS

DR. WM. O. SWEEK, of Phoenix, returned about the middle of October from a trip through eastern clinics, including New York, Philadelphia, Boston and Chicago.

DR. J. D. HAMER, of Phoenix, spent his vacation during October touring over Arizona and getting acquainted with the state of his adoption.

DR. GUY C. FRENCH, formerly of St. Louis, is now associated with Dr. W. O. Sweek of Phoenix. Dr. French graduated from St. Louis University in 1926, and registered in Arizona by reciprocity in July.

THE LADIES' AUXILIARY of the MARICOPA COUNTY MEDICAL SOCIETY held their annual meeting on October 7th, at the Arizona Club. The new officers for the ensuing year are Mrs. Orville H. Brown, president; Mrs. W. Warner Watkins, vice-president; Mrs. Howell Randolph, secretary.

THE GOOD SAMARITAN HOSPITAL STAFF held its annual meeting the last Monday evening of October. The new officers elected at that meeting are Dr. Harlan P. Mills, chairman, Dr. S. I. Bloomhardt, secretary. Further report of that meeting will be published in a future issue.

DR. GEORGE TRUMAN, of Mesa, who recently contracted undulant fever, attributes the source of of infection to a patient upon whom he was operating following a miscarriage. He believes the patient was suffering from abortus infection and that this was transmitted to him through the skin route.

DR. KIMBALL BANNISTER of Phoenix, recently annexed the Arizona golf championship again, in the annual tournament held at the Verde Valley Country Club course, at Clarkdale.

DR. O. C. WEST, the first full time epidemiologist in Arizona, has taken up his duties in Maricopa County, working under the county health department. Dr. West was formerly in industrial work in old Mexico, since which time he has trained himself for epidemiological work.

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PHOENIX: VILLAGE OR CITY?

Those of us who live in Phoenix feel a just pride in its growth and prosperity. The greater our affection for our city, the keener is our chagrin over its failures to measure up to the requirements of a real city. One of the qualities for which Phoenix has attained world fame is that of being a healthy place to live. So absolutely have we depended upon our natural advantages in climate, that we have largely ignored the requirements for health protection and health conservation. The state superintendent of public health for Arizona, in addressing a luncheon club recently, called attention to the astounding conditions in Phoenix and Maricopa county. This county is probably the only geographical unit in the United States with more than a hundred thousand people which has no hospital for contagious cases, for indigent sick, either permanent residents or transients, or for accidents on the streets or highways. That is a very necessary function of any city which pretends to have graduated from the village class. There are plans under way which it is hoped will remedy this situation in the near future. Furthermore, neither the city of Phoenix, nor the county of Maricopa, make any effort worthy the name to study contagious diseases and control the spread of these through the population. Very recently the county has taken the first step in this direction by employing a full time epidemiologist. But this is only one step in a long journey toward a modern health department for a community of an eighth of a million people. Providence has been good to us in years past, but there is a point beyond which it is foolish to trust to climate,—or even Providence,—to protect us from the consequences of our carelessness.

PECOS VALLEY MEDICAL ASSOCIATION

The twentieth annual session of the Pecos Valley Medical Association was held at Roswell, N. M., on October 10th. The scientific program was held in the Elks Club. After call to order and invocation by Dr. W. E. Goodsell, the President's Address was delivered by Dr. H. A. Stroup. Following this an address was given by Col. J. D. Atwood. The election of officers for the ensuing year was then held, the following being elected:

President, Dr. W. T. Joyner of Roswell.

Secretary-Treasurer, Dr. C. F. Beeson, Alamogordo.

Member Board of Censors, Dr. J. G. Holmes, Alamogordo.

In the afternoon the following papers were read on the Scientific Program:—

1.—The Silver Suture—Report of Case.....
Dr. J. G. Holmes, Alamogordo, N. M.
Discussion opened by Dr. H. A. Ingalls, Roswell

3.—Some Unusual Abdominal Symptoms Associated with Cardio-vascular Disease.....
Dr. G. Werley, El Paso, Texas
Discussion opened by Dr. W. C. Buchly, Roswell

3.—Lessons Learned at Necropsy in Pulmonary Tuberculosis .....
Dr. G. H. Faget, U. S. Hospital, Ft. Stanton
Discussion opened by Dr. C. F. Beeson, Roswell

4.—Evaporated Milk in Infant Feeding.....
Dr. Charles F. Milligan, Clayton, N .M.
Discussion opened by Dr. C. E. McClane, Roswell

5.—Use of Duodenal Tube as a Therapeutic Measure in Certain Medical and Surgical Cases.....Dr. W. L. Brown, El Paso, Texas
Discussion opened by Dr. Bradley, Roswell, N. M.

6.—Observations on Prostatic Obstruction.....
Dr. K. D. Lynch, El Paso, Texas
Discusion opened by Dr. Guy, Roswell, N. M.

7.—Gonorrhea in the Female.....
Dr. Guy, Roswell, N. M.
Discussion opened by Dr. K. D. Lynch, El Paso, Tex.

8.—Indications and Contra-indications for Surgical Removal of Gall Bladder.....
Dr. H. A. Miller, Clovis, N. M.
Discussion opened by Dr. W. L. Brown

9.—Ten Years of Public Health Work in New Mexico.....Dr. G. S. Luckett, Santa Fe, N. M.
Discussion opened by Dr. Puckett, Carlsbad, N. M.

10.—Non-Surgical Treatment of Cervix.....
Dr. W. M. Lancaster, Clovis, N. M.
Discusion opened by Dr. W. T. Joyner, Roswell

11.—Local Signs of Infected Tonsils.....
Dr. D. D. Swearingen, Roswell, N. M.
Discussion opened by Dr. Horwitz, Roswell, N. M.

Meeting closed with a banquet in the evening, at the Hotel Nickson, at which the members, visiting doctors and lady visitors were entertained.

The Committee on Arrangements for the meeting were Drs. H. A. Ingalls, C. E. McClane and C. F. Beeson, with the wives of all local physicians.

EL PASO MASONIC HOSPITAL STAFF MEETING

DR. JOHN A. HARDY reported a case of acute appendicitis, complicated by intestinal obstruction, and terminal penumonia as follows:

Patient. a strong healthy man of 39. was traveling by automobile in Mexico and West Texas, when he developed an acute abdominal pain which he diagnosed as appendicitis. He took laxatives, calomel and salts, and continued to travel in an effort to reach his family physician. He walked into the hospital ten days after the onset of his illness. On entrance he had temperature 101, pulse 90 and respiration 20. He had been having chills for the past three days. Suddenly his temperature dropped, and he went to the operating room with diagnosis of acute appendicitis, probably ruptured appendix.

His past history was one of almost perfect health with exception of occasional indigestion.

Physical findings prior to going to surgery: Patient looked sick. He had a cough and said he had a little cold. Examination by anesthetist pronounced him safe for anesthesia. There was general tenderness over the abdomen. He lay with his leg flexed. Palpation of the normal site of cecum and appendix caused the patient to cry out with pain. The rest of the physical examination was negative for pathology.

Under nitrous exide-ethylene anesthesia a right rectus incision was made. Peritonitis was apparent, but surprise was felt by the surgeon when he did not encounter an abscess in the appendiceal region. The appendix was long. densely adherent, could not be vizualized, but could be palpated and adhesions were released until the appendix was delivered. No pus was encountered. The appendix was removed by usual technic and the wound closed with drain.

Examination of tissue by Dr. George Turner, Staff Pathologist: The tissue consists of the appendix. It measures 60x8 mms. The serosa is of a light brown color from congested blood vessels. All wall layers are thickened and infiltrated with polynuclear cells. The lumen is practically closed from the thickening of the mucosa. Diagnosis: Appendicitis, acute.

Progress record: Returned from surgery in fairly good condition. Proctoclysis given, morphine as needed for pain. The next day he was somewhat distended, and enemata brought some relief. Patient began to look anxious, perspired freely, the wound was draining, stupes applied to relieve the distention. The next day distention up beneath the sternum and patient complained of pain and dyspnea. Abdomen rapidly became rigid, vomiting began, duodenal tube inserted and stomach washed with soda solution. Duodenal tube left in situ. Hypodermoclysis was given, and normal saline given intravenously while the surgery was being prepared for enterostomy. Under morphine, and with the use of novocain, the abdomen was opened, and enterostomy done, the tube being sutured to the intestine with linen. His condition rapidly improved. Patient's bowels moved, in fact he had some diarrhea and paregoric was given to correct this condition. He began to take food, seemed on the way to recovery, when he began to cough and raise a small amount of purulent sputum, and died within 48 hours of the onset of pneumonia.

Discussion of this case brought out the fact that in many autopsies done on cases of sudden death, cause unknown, pneumonia had been found to be the cause. Dr. Hardy recalled one case of such nature when the patient's entire illness was only 24 hours' duration, and postmortem revealed that pneumonia was the cause of death.

Dr. J. HAL. GAMBRELL reported the second case. A man with a gangrenous gallbladder, unruptured, but with acute peritonitis. This patient was a man of 71, large, stockily built, never having had any serious illness except a "weak stomach" the real symptoms of which it was impossible to elicit.

This man and his brother had a small store, and the patient was working in the store up to the day of his sudden acute illness, and subsequent operation at 2 a. m.

The following history was obtained from the brother: The patient was seized with severe abdominal pain of a cramp-like nature, was somewhat nauseated but did not vomit. Has had a failing appetite for the past three weeks, and has taken very little food. His past history is absolutely negative except for a vague history of dyspepsia.

Physical findings on hospitalization showed temp. 103, pulse 140, resp. 40. Board-like rigidity of the entire abdomen, no one region more tender than the other. Dr. Harry Safford had seen the patient, diagnosed as acute peritonitis, suspecting the appendix as being the focus of infection. Dr. Gambrell was called to operate. Urinalysis showed positive three plus albumin, moderate amount of hyaline and coarsely granular casts, small amount of epithelium. and small amount of pus.

Blood: Hemoglobin 90, leukocytes 12,750, small lymphocytes 6, large lymphocytes 3, transitional 1, polynuclears 90. Under ethylene anesthesia an exploratory laparotomy was done. A right rectus incision was made and an attempt made to locate the cause of the peritonitis. The appendiceal region was found not to be its origin. The gallbladder on palpation seemed to be full of stones and was so far under the costal margin that removal was not advisable in the patient's condition. There was free fluid in the abdomen. No attempt was made to free the adhesion in the gallbladder region. Free drainage was instituted and the abdomen closed without the removal of any tissue. Patient expired within forty-eight hours.

Report of DR. GEORGE TURNER. The body is that of a man about 70 years old. It is very fat and will weigh about two hundred and fifty pounds. There is an operative wound through the right rectus muscle in the upper abdomen. There is a rubber drain extending through the wound from the gallbladder area. The abdominal wall is very thick and fat. On opening the abdomen the peritoneum is everywhere congested and the omentum is very much thickened and indurated. The liver is high, with rounded borders and its structure soft. The gallbladder is gangrenous and filled with stones, bile stained mucus, pus and blood. There was no opening through the wall of the gallbladder that allowed its contents to scatter free in the abdominal cavity but gangrenous areas due to blood vessel thrombois allowed the infection to extend to the peritoneum which accounts for the peritonitis.

The appendix was retrocecal and extended well up toward the gallbladder but was NOT involved. The lungs were negative. The heart was negative except for acute toxic change and extensive fat deposit. The kidneys were rather large and irregular. The irregularity was due to old scar tissue contractions, from chronic nephritis. They were much congested with prominent glomeruli and easily peel-

ing capsules. This was due to acute nephritis which gave the picture of actue nephritis superimposed upon a chronic fibrous change.

Diagnosis: Peritonitis general; gangrenous gall bladder, with stones; nephritis, acute and chronic.

In discussing this case Dr. Turner brought out the fact that this patient had acute general peritonitis, although the contents of the gangrenous gallbladder had NOT spilled into the abdominal cavity. He called attention to the possibility of having general peritonitis from an unruptured but pus bearing appendix or gallbladder without a rupture of the infected organ. Also he remarked that it was generally believed, in acute cholelithiasis or cholecystitis, that the appendix will almost surely be involved, and especially when the appendix lies in the position that this one did, encroaching upon the infected area. The appendix was not diseased.

MARICOPA COUNTY (Arizona) MEDICAL SOCIETY

The meeting of the Maricopa County Medical Society, April 22, 1929, was held at the Good Samaritan Hospital.

Dr. Watkins presented the matter of fewer medical meetings by consolidating the county medical society meetings with the staff meetings of the two hospitals in such a way that each staff may hold a meeting during each month. Dr. Holmes moved to appoint a committee of three to confer with officers of the staffs of the two hospitals and decide the matter of arrangement of the medical meetings. Dr. Bailey appointed Dr. Watkins, Dr. Greer and Dr. Frank Milloy to act on this committee.

Minutes of the last meeting were read and accepted. Report of the committee on the petition to employ home labor in building the medical building, by Dr. O. Brown. Mr. Brooks, Business Manager for the carpenters, spoke for a few minutes in favor of having organized labor do the work on the Medical Arts Building. Mr. Drake, Secretary of the Carpenters Union, also spoke against the resolution for the employment of organized labor.

Dr. Palmer introduced Dr. William J. Mayo, who spoke on the cancer problem, giving marvelous survey of etiology of cancer, and made some observations on the subject of late development in physics of light. Dr. Albert Soiland of Los Angeles spoke of certian phases of cancer problem, from the standpoint of treatment.

Dr. Donaldson asked, "Why wait for three weeks before operating on a case after radiation?" Dr. Soiland answered by stating that the length of time depended entirely upon the case.

Meeting adjourned.

May 6

Meeting was called to order by President Bailey. There was a large attendance. The minutes of the last meeting were read and adopted.

A discussion of the question of whether the Medical and Surgical Association of the Souhtwest should call upon outside men for the program next fall or rely principally upon speakers within the organization showed that the majority of those present were in favor of the latter plan.

New comers to Phoenix and potential members of the society were introduced as follows: Dr. Sherrill, Pediatrics, Dr. Palmer Dysart—Phoenix, interning at the St. Joseph's Hospital.

A very interesting program was presented upon the subject of diabetes. There were seven well presented papers including one out of town speaker, Dr. Robert Flinn of Prescott.

May 20

The meeting was called to order by the President. Minutes of previous meeting were read and adopted.

The matter of recommendations to the builders of the new Medico-Dental Building that they use Arizona labor was discussed. It was decided to leave the matter until the committee investigated and made some recommendation in regard to the matter.

Dr. Watkins brought up the question of a library

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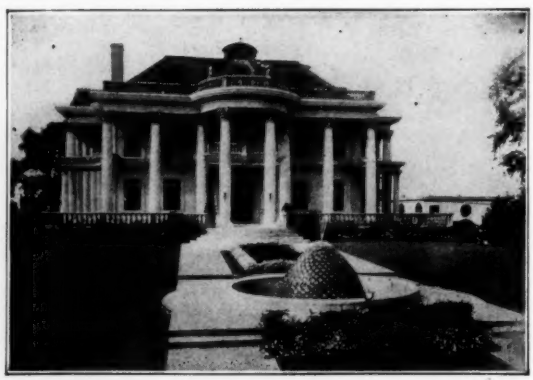

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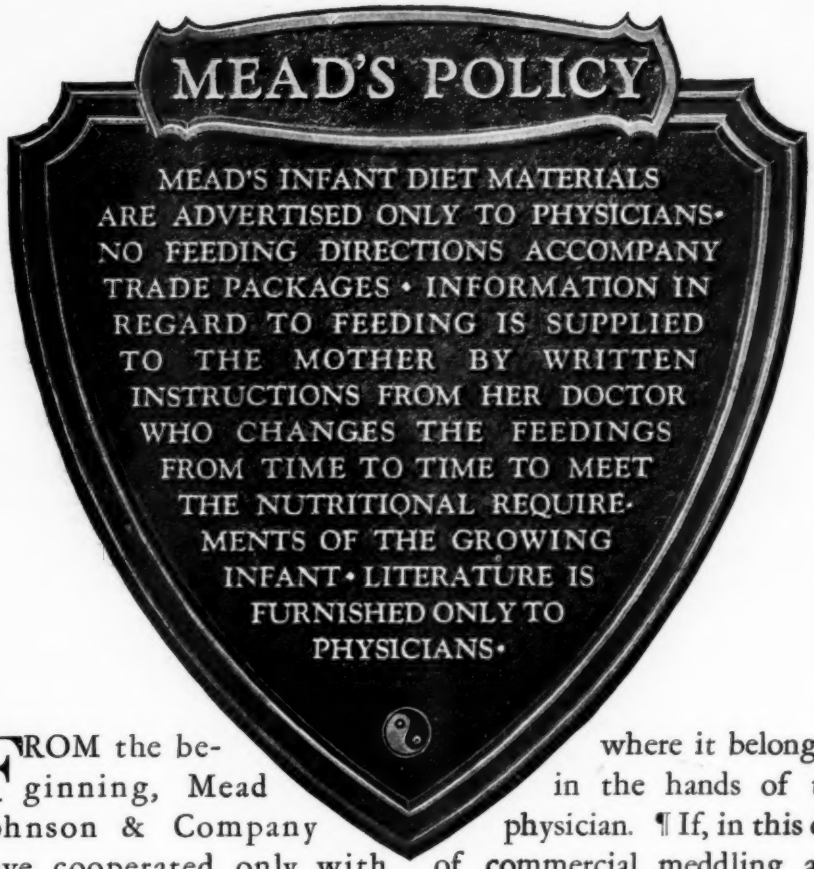
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fund and recommended that the society buy a sufficient number of magazine holders to take care of the journals on hand, and either store them or put them in the hands of custodians who will care for them until such time as there is a place to house the library. He has found that the boxes will cost about 80 cents a piece, and that about 200 will be needed. The proposition was discussed and a motion was made by Dr. Brown to buy a sufficient number of boxes to take care of the journals on hand. Seconded, carried.

It was suggested that a library committee be appointed. Dr. Bailey (President) appointed Dr. Watkins, Dr. O. H. Brown and Dr. Howell Handolph.

Program:

Dr. Harbridge—"Capsulotomy Method of Expression of Cataracts."

General discussion.

Dr. Greer—"Remarks on Low Back Pain."

Drs. Sweek and Patterson—"Comparison of Local and General Anesthesia in 800 cases of Laparotomy."

June 3.

Minutes read and adopted. The names of Dr. Lieuallen and Dr. A. A. Browning were voted upon and accepted unanimously into the society.

Dr. Greer made an announcement that a group of medical men met June 1st and listened to a proposition by a Los Angeles contracting firm offering to erect a medical building in the near future. It was voted by this group to give the Johnson people thirty days in which to start breaking ground.

Dr. Jordan gave a paper on "Epidemic, Cerebro-Spinal Meningitis" followed by discussion by Dr. Mills .

Dr. Wells spoke about cooperation of the physician with the Public Health officer in public health matters.

BOOK REVIEWS

DISEASES OF THE NOSE, THROAT AND EAR.—(Sixth Edition)—A Manual of Diseases of the Nose, Throat and Ear; by E. B. Gleason, M. D., LL. D., Professor of Otology, Graduate School of the University of Pennsylvania; Sixth Edition; Thoroughly Revised; Twelve mo of 617 pages with 262 illustrations. Philadelphia and London: W. B. Saunders Company, 1929. Cloth $4.50 net.

This is a small, almost pocket size, book of 617 pages. The fact that it has gone through six editions speaks for its popularity.

It is designed to supply students and general practitioners with the essential facts of rhinology, laryngology and otology. It presents the facts of anatomy, methods of operations and treatments, simplified as much as possible. It also gives a collection of formulae and a list of the more important drugs used in the specialty.

Many of the engravings are made from sections by the author. This seems to the reviewer to be a most practical book.—O. H. B.

THE SURGICAL CLINICS OF NORTH AMERICA; Volume nine, Number two, (Chicago Number, April, 1929); 243 pages with 70 illustrations. Per Clinic year, (February, 1929, to December, 1929), Paper $12.00; Cloth, $16.00. Philadelphia and London; W. B. Saunders Company.

This volume contains contributions by a number of well known men. Dr. Arthur Dean Bevan writes upon the Acute Abdomen. He presents a number of

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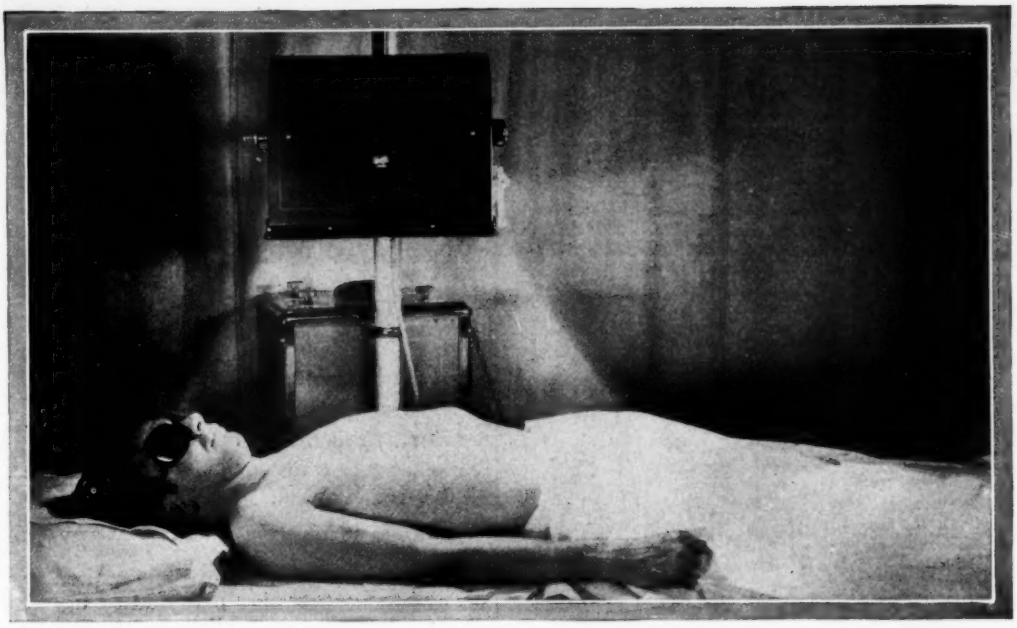

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—A. J. CEMACH, M. D. *An extract from his article, "Ultraviolet Therapy in Oto-Rhino-Laryngology," read before the Second International Conference on Light and Heat in Medicine and Surgery, University of London, 1928.*

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unusual cases and discusses them from a diagnostic standpoint.

Dr. Kellogg Speed writes upon the Ununiting Fracture Neck of the Femur.

Dr. Carl A. Hedblom writes upon the Surgical Treatment of Pulmonary Tuberculosis.

Another interesting subject is the Acute Intestinal Obstruction of the Appendix. This is discussed by Dr. Edwin M. Luhr. These and the other articles in the voulme are worth reading. —O. H. B.

GONORRHEA AND KINDRED AFFECTIONS

GONORRHEA IN THE MALE, CHANCROID AND VERRUCA ACUMINATA; By George Robertson Livermore, M. D., F. A. C. S.; Professor of Urology, Medical Department, University of Tennessee, Memphis; Consulting Urologist, Memphis General and Baptist Memorial Hospitals, and Hospital for Crippled Adults; Attending Urologist, St. Joseph's Hospital; Fellow American Association of Genito-Urinary Surgeons, Southern Surgical Association, American Urological Association, Etc.; and

GONORRHEA IN THE FEMALE, AND THE INFECTIOUS GRANULOMATA; By Edward Armin Schumann, A. B., M. D., F. A. C. S.; Associate Professor of Obstetrics, University of Pennsylvania; Gynecologist and Obstetrician to Philadelphia General Hospital; Gynecologist to Frankford Hospital; Gynecologist and Obstetrician to Jewish Hospital; Obstetrician to Chestnut Hill Hospital; Gynecologist and Obstetrician to Memorial Hospital; Fellow, American Gynecological Society, Obstetrical Society of Philadelphia, Etc.; D. Appleton and Company, New York, London; 1929; $5.00.

This is a classical work upon the subject matter indicated by the title. The authors are professional men of excellent training and standing.

The book is illustrated with excellent cuts, mostly photographs and drawings. The strong factors of the book probably are the paragraphs devoted to treatment.

For the most part the language is excellent. They have a tendency to use superfluous adjectives as "some," "about" and "piece of." For example they say a piece of" antiseptic gauze wrapped around a "piece of" ice. This expression is found in the last five lines of Page 71. At the bottom of page 88 they say: "Cystitis is an inflammation of the bladder which, as far as this text is concerned, is due to the gonococcus." The next sentence reads: "This work is concerned only with gonorrheal infection of the bladder." One or both of these sentences might be omitted without the text being misunderstood.

The work of the publishers is of the best. An excellent grade of paper has been used; the type is easy to read. No typographical errors were found. The book is recommended to all as one of the clearest on the important subject of gonorrhea and its associated affections.—O. H. B.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY: A complete dictionary of the terms used in medicine, veterinary science, biology, medical biography, etc., with the pronunciation, derivation, and definition by W. A. Newman Dorland, A. M., M. D., F. A. C. S., Lieut.-Colonel, M. R. C., U. S. Army; Member of the Committee on Nomenclature and Classification of Diseases of the American Medical Association; Editor of "American Pocket Medical Dictionary"; Fifteenth edition, revised and enlarged with the collaboration of E. C. L. Miller, M. D., Professor of Bacteriology and Biochemistry, Medical College of Virginia; Philadelphia and London; W. B. Saunders Company; 1929.

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The preface to this edition says that this has been the best revision this dictionary has ever had and that it has been re-edited by the editorial staff of the American Medical Association.

The book has been re-set from new type and many illustrations have been added. The type is easy to read and yet is not large. There are 1427 pages and the book is small as compared to most dictionaries.—O. H. B.

THE NOSE, THROAT AND EAR AND THEIR DISEASES: (In original contributions by American and European Authors) Edited by Chevalier Jackson, M. D., Professor of Bronchoscopy and Esophagoscopy in the University of Pennsylvania, in the Jefferson Medical College, and in the Graduate School, University of Pennsylvania; and George M. Coates, M. D., Professor of Otology, Graduate School, University of Pennsylvania; Octavo volume of 1177 pages with 67 illustrations and 27 inserts in colors: Philadelphia and London; W. B. Saunders Company, 1929; Cloth, $13.00 Net.

There are 74 contributors in this encyclopedic work. It seems that every pathologic state of the ear, nose and throat together with the most likely lines of treatment has been included in this book.

It would seem that such a well known procedure as the use of the Dowling tampon would at least be mentioned in the index. The index seems to be comprehensive but no mention of Dowling tampon is found in it.

A chapter is devoted to bronchial asthma and asthmatic bronchitis, allergy, angioneurotic edema and eczema; these are presented by Dr. I. Chandler Walker. His description of the development of the asthmatic attack seems to the reviewer to be a very crude one. His statement that eczema in adults is less often due to food proteins than in children does not agree with the reviewer's experience.

Most of the chapters have numerous references to the literature. This feature plus the comprehensive nature of the book makes it a valuable one for all practitioners especially for those of the ear, nose and throat specialty.—O. H. B.

THE MEDICAL CLINICS OF NORTH AMERICA: (Issued serially, one number every other month); Volume 13, No. 1. (Boston Number, July, 1929). Octavo of 280 pages with 36 illustrations: Per Clinic year, July, 1929 to May, 1930, Paper, $12.00; Cloth, $16.00 net; Philadelphia and London: W. B. Saunders Company, March, 1929.

Medical Clinics of North America, by reputation, can scarcely be enhanced by any remark the reviewer can make.

The first and perhaps one of the most interesting articles in this volume is by Dr. George R. Minot upon "A Non-fatal Case Simulating Acute Leukemia with Anemia and Thrombopenic Purpura." This article covers only nine pages but it is bristling with suggestive facts.

Dr. Joslin and co-workers give an excellent article on diabetic coma.

Dr. Frederick T. Lord discusses a case of diaphragmatic hernia.

Dr. Robert S. Palmer and Dr. Howard B. Sprague discuss four cases illustrating the untoward symptoms which may be produced by the use of potassium sulphocyanate in the treatment of hypertension.

There are other interesting articles in the issue; the treatment of eclampsia, endocaritis and ulcer of the esophagus, are some of them.—O. H. B.

PHYSICAL EXAMINATION AND DIAGNOSTIC ANATOMY: By Charles B. Slade, M. D., formerly Chief of Clinic in General Medicine, University and Bellevue Hospital Medical School, New York; Fourth Edition, thoroughly revised; 12mo of 196 pages with 43 illustrations. Philadelphia and London: W. B. Saunders Company, 1929. Cloth, $2.00.

This is a helpful, practical, well-written and concise book upon the subject of physical examination. Every physician should have such a volume on his desk for ready reference.—O. H. B.

MINOR SURGERY. By Frederick B. Christopher, M. D., Associate in Surgery at Northwestern University Medical School, Chicago; with a Foreword by Allen B. Kanavel, M. D., Professor of Surgery, Northwestern University Medical School. Octavo of 694 pages with 465 illustrations. Philadelphia and London; W. B. Saunders Company, 1929. Price $8.00 net.

The first thought on looking at the new surgery was that there were already in existence enough works on the subject. But after one has had a chance to review Dr. Christopher's book he becomes impressed that the doctor has assembled something different from the ordinary run of books on surgery. He seems to have devoted his attention toward accumulating all the "little" tricks in surgery. There is a world of helpful things in this book.

Every general practitioner and surgeon will wish to have this book.—O.H.B.

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